Received: 10 April 2023 | Revised: 3 August 2023 | Accepted: 11 August 2023

DOI: 10.1002/ajim.23531

RESEARCH ARTICLE

AMERICAN JOURNAL OF INDUSTRIAL MEDICINE WILEY

Impact of COVID-19 on occupational injuries and illnesses among nursing care facility workers: Analysis of California workers' compensation data, 2019–2021

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Funding information
Health Resources and Services Administration

Abstract

Background: The coronavirus disease 2019 (COVID-19) pandemic greatly affected healthcare workers, both physically and psychologically, by increasing their workload and stress. This may also have increased their risk of occupational injuries. This study analyzed workers' compensation (WC) claims among California nursing care facility workers during 2019–2021, to assess the impact of the pandemic on occupational injury risk.

Methods: This study used data from the California Workers' Compensation Information System. WC claims in prepandemic and pandemic periods were described and compared between nursing care facilities and other settings. Nursing facility cases were described by demographic, job, and injury characteristics.

Results: In 2019–2021, we identified 41,134 claims as nursing facility cases in California. Annual claims increased by 64.6% from 2019 to 2020 and then decreased in 2021, returning to levels similar to pre-COVID. In contrast, non-healthcare settings had decreases in claims during the pandemic. COVID-related claims accounted for 50.5% of claims in nursing facilities in 2020–2021; this proportion was much higher compared with other healthcare (35.7%) or nonhealthcare settings (14.3%). Non-COVID claims decreased during the pandemic but mental disorder or stress claims increased in nursing facilities, particularly in 2020 (+42.5%).

Conclusions: Our findings show that nursing care facilities were more severely affected by the pandemic than other settings. We did not find evidence of an increased risk of occupational injuries during the pandemic, except for increased claims for stress or mental disorders. Our findings indicate a clear need to address psychological stress and mental health among nursing facility workers during a pandemic.

KEYWORDS
COVID, nursing care facilities, nursing home, occupational injury, pandemic, skilled nursing facilities

1 | INTRODUCTION

Nursing care facilities (nursing homes or skilled nursing facilities) are well known to be workplaces with a high risk of occupational injuries or illnesses.[1,2] In 2019, over 70,000 nonfatal occupational injuries or illnesses were reported from nursing care facilities in the private sector in the United States, and 63% of these injuries or illnesses resulted in lost workdays, job transfers, or job restrictions in affected workers.[1] The incidence rate of occupational injuries or illnesses in nursing care facilities was 6.0 per 100 full-time equivalents, which was twice as high as the rate in all industries.[2]

In addition to the usual high injury risks at nursing care facilities, the coronavirus disease 2019 (COVID-19) pandemic created further unprecedented challenges, threatening the health and lives of workers as well as residents. The healthcare workers who provided care on the frontlines as essential workers were among the most affected by the COVID-19 pandemic.[3,4] Nursing care facilities have been shown to be more vulnerable to COVID-19 infections, because of the advanced age and comorbidities of nursing home resident.[5–7] Furthermore, the high levels of functional impairment and subsequent need for assistance with activities of daily living among residents require frequent close physical contact between residents and care staff,[8] which increases the risk of infection and transmission in nursing care facilities. As of March 2023, there were 165,167 deaths among residents and 3037 deaths among staff due to COVID-19 in nursing homes in the United States.[9]

In addition to the infection risk, the COVID-19 pandemic greatly affected healthcare workers both physically and psychologically by increasing their workload and stress.[3,4] A qualitative study of 152 nursing home workers from 32 states reported on their experiences, including fears of COVID infection and transmission to their families, constraints on testing, extended use and reuse of personal protective equipment (PPE), and burnout due to staffing shortages, increased workloads, new responsibilities, and the emotional burden of caring for residents experiencing distress, illness, and death.[10] Numerous studies have reported on the negative impacts of the COVID-19 pandemic on mental health and well-being in healthcare workers, with a high or increased prevalence of depression, anxiety, insomnia, stress, posttraumatic stress disorder symptoms, and burnout.[11–24] A recent meta-analysis study reviewed 83 studies on mental health in healthcare workers during the COVID-19 pandemic and reported a pooled prevalence of 41.4% for anxiety, 37.1% for depression, 44.9% for stress, and 43.8% for insomnia.[23] Moreover, several studies reported high or increased prevalence of adverse skin reactions from the prolonged use of PPE.[25–27] Wearing PPE, such as full-body protective clothing and face shields, can also affect workers' body movements, comfort, and visibility.[28–30]

The increased physical and psychological job demands may increase the risk of injury for workers. However, there has been a paucity of research on how the COVID-19 pandemic affected the risk of occupational injury, whereas considerable research has addressed its negative effects on mental health in healthcare workers.[11–24] A Turkish study reviewed hospital medical records of patients with occupational accidents between 2019 and 2021, and reported that occupational accidents increased in the healthcare and transportation sectors during the pandemic, while all other sectors showed decreases.[31]

To address the data gap, we conducted this study to assess the impact of the COVID-19 pandemic on occupational injury or illness incidence in nursing care facility workers. We aimed to describe the number and rate of workers' compensation (WC) claims between 2019 and 2021 and changes over time among California nursing care facility workers, and characterize the claims cases by demographic, job, and injury. We also compared the pattern of changes in WC claims over the study period between nursing care facilities and other settings.

2 | METHODS

2.1 | Study design and data source

This study was a retrospective descriptive study with a time-series design. We obtained the WC First Report of Injury (FROI) data between 2019 and 2021 from the California Department of Industrial Relations (DIR) by creating a Memorandum of Understanding. In California, occupational injuries and illnesses that result in lost workdays or require medical treatment beyond first aid must be reported to the DIR.[32] The Workers' Compensation Information System (WCIS) in the DIR collects data on the injured employees, employers, industry, occupations, injuries, claims status, benefits, and payments. Claim administrators—insurers, self-insured self-administered employers, or third-party administrators—are required to submit first and subsequent reports of injury, medical bill/payment records, and annual summary of benefits to WCIS via an electronic data interchange system.[32] WCIS covers all employers in California, except for federal employers (e.g., Veterans Affairs healthcare system or US Postal Service), self-employed, and military.[32] As we used the FROI data, the claims analyzed in this study are filed claims, not accepted claims.

2.2 | Case definitions

Nursing care facility cases were identified by multiple approaches. First, we used the WCIS data elements of the industry code (North American Industry Classification System [NAICS] 623110 skilled nursing facilities) and class code (8829 nursing homes). In cases where the industry code and class code were not consistent (due to one code indicating a residential care facility or another industry, or being missing), we reviewed the employer name on the claim to determine the case. For the employer name (skilled nursing facilities), we referred to the Licensed Healthcare Facility Listing of the Department of Health Care Access and Information.[33] We also referred to the Industry and Occupation Computerized Coding

System by the National Institute for Occupational Safety and Health (NIOCCS) and used the NIOCCS coding results based on the employer name as additional evidence in determining the case. For government-owned facility cases coded as government industry (thus, not captured by industry code or class code), we used the employer name of the claim and the zip code of the injury site to identify those cases. Depending on the level of evidence, we classified nursing care facility claims into definite, probable, and possible cases. Definite cases were claims in which both the industry code and class code indicated nursing care facilities. If the employer name definitely indicated another industry (e.g., psychiatric hospital), we excluded it from this category. Probable cases included claims indicated by (1) the employer name (matched to the reference list) and (2) both the industry code (not class code) and NIOCCS coding. Possible cases included (1) claims indicated by the class code (not industry code) and either the employer name or NIOCCS coding and (2) government facility cases.

For other settings, we classified cases into other healthcare and nonhealthcare. Other healthcare cases were defined by NAICS codes (621 ambulatory health care services; 622 hospitals; 6232, 6233, 6239 residential care facilities) and WCIS class codes (8834 physicians; 8839 dentists; 8852 home infusion therapists—all employees; 9043 hospitals; 8823, 9070, 9085 residential care facilities; 7332 ambulance service). Further, the employer name of the claim and the zip code of the injury site were used for additional case search (e.g., government hospital cases). After identifying nursing care facility and other healthcare cases, the remaining cases were defined as nonhealthcare cases.

COVID-related cases included COVID infection claims, as well as claims of problems related to COVID testing or vaccination. To identify COVID-related cases, we first used the following approaches: (1) cause of injury code: 83 (pandemic) and nature of injury code: 83 (COVID); (2) cause of injury code: 83 (pandemic) and nature of injury code: 36 (infection), 65 (respiratory disorders), 73 (contagious disease); and (3) injury description including the term "COVID" or "CORONA VIRUS". For the latter two approaches, we determined by manually reviewing the narrative injury descriptions and the cause and nature codes.

2.3 | Study variables

Cases were described by time of injury (year and month), age, gender, job tenure (the time from hire to injury, in years), occupation, and injury characteristics (cause of injury, nature of injury, affected body part). For occupation, the information was provided only as narrative descriptions in the WCIS. We developed a healthcare occupation coding method using search terms and manual reviews of occupation descriptions, and classified occupations into 14 categories (e.g., nursing assistant or other care aide, licensed practical/vocational nurse, registered nurse, food services, housekeeping, or environmental services). For nature of injury, we primarily used reported nature of injury codes. Among injury natures, stress claims were identified by the nature of injury code 77 (mental stress). Additionally, we identified stress claims by injury descriptions, using the search term "STRESS" and then determined the nature by manually reviewing the claim information (injury description, nature of injury code, and cause of injury code).

2.4 | Data analysis

Data analyses were performed using the SAS 9.4 Statistical Package. The annual and monthly numbers of WC claims (COVID-related and other) were described by setting (nursing care facilities, other healthcare settings, and nonhealthcare industries) and the percent changes from 2019 to 2020, and from 2019 to 2021 were calculated. Annual claim incidence rates by setting were calculated using the employment data from the Bureau of Labor Statistics (BLS)[34] as the denominator. Trends of annual or monthly claim rates over time were examined by fitting a negative binomial regression model and the coefficients for rate changes were converted to incidence rate ratio (IRR) and 95% confidence intervals (CIs). Nursing care facility claims in the prepandemic (2019) and pandemic (2020–2021) periods were characterized by demographic, job, and injury characteristics. For claims during the pandemic period, we used multivariable logistic regressions to compare demographic and job characteristics between COVID-related and other claims. Odds ratios and 95% CIs were obtained. For injury characteristics, percent changes of claims from 2019 to 2020 and 2021 were calculated.

3 | RESULTS

3.1 | Numbers and rates of claims in prepandemic and pandemic periods

Between 2019 and 2021, there were 2,082,849 WC claim reports in California, and 272,949 (13%) claims were identified as healthcare cases. Among these, we identified 41,134 claims as nursing care facility cases: 18,898 definite (46.0%), 8854 probable (21.5%), and 13,382 possible (32.5%) cases. During 2020–2021, 12,081 claims in nursing care facilities were defined as COVID-related claims (40.4%).

Figure 1 shows COVID-related and other claims during 2019–2021, by month and by settings. For COVID-related claims, nursing care facilities had a steeper increase than other settings in the beginning of the pandemic. COVID-related claims showed a surge in December 2020 in all settings and then remained at a very low level until December 2021 starting to resurge. For non-COVID claims, other healthcare and nonhealthcare settings had steep decreases in the beginning of the pandemic, but such a pattern was not observed in nursing care facilities.

Table 1 shows the annual numbers and rates of WC claims and changes between prepandemic and pandemic periods by setting. In nursing care facilities, the number of claims increased by 64.6% from 2019 (n = 11,233) to 2020 (n = 18,490), which was due to

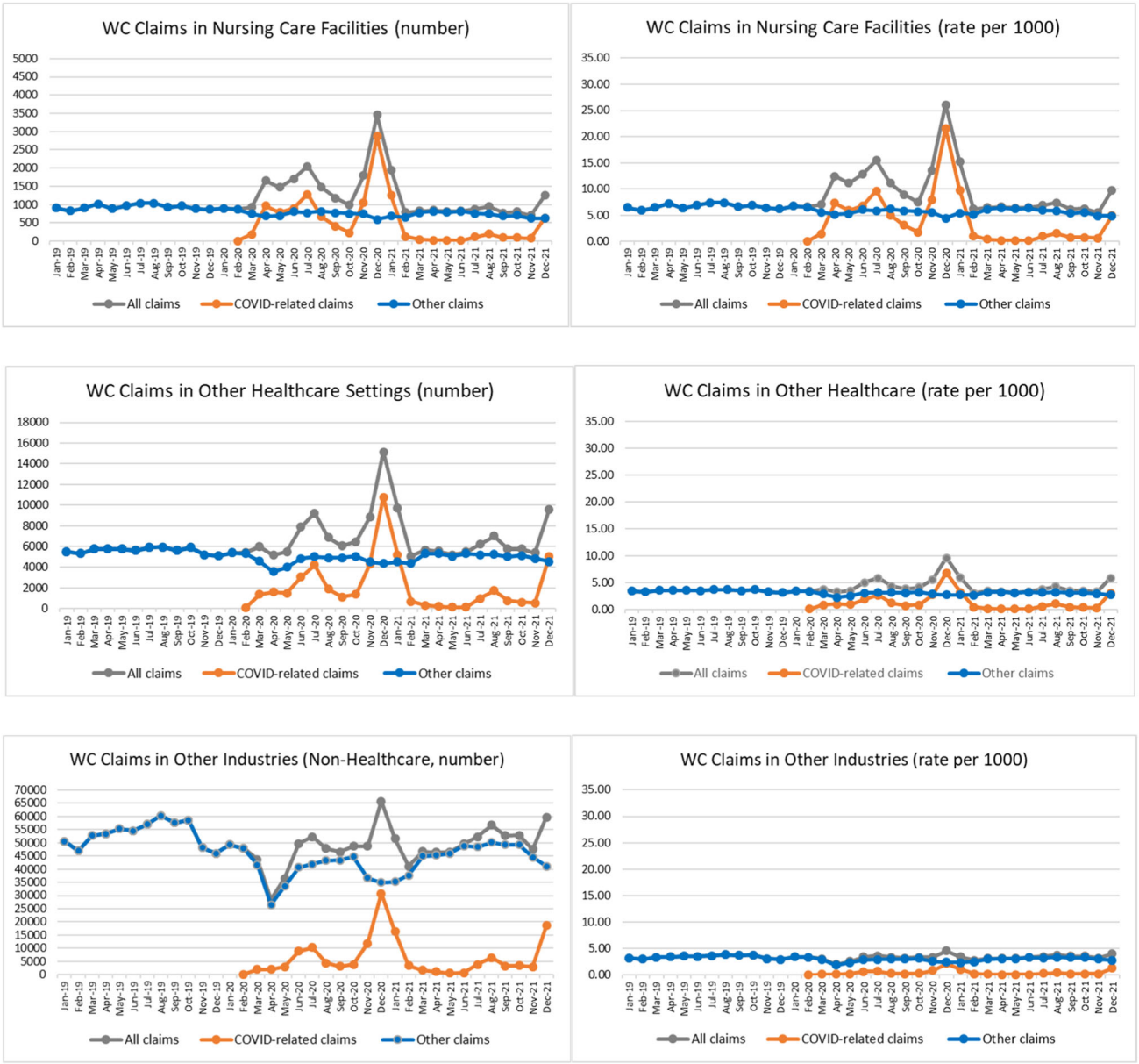

FIGURE 1 Workers' compensation (WC) claims filed by month from 2019 to 2021 in California: Numbers and rates (per 1000 employees) in nursing care facilities and other settings. Data source: California Department of Industrial Relations, Workers' Compensation Information System.

COVID-related claims (n = 9346). This increase was 2.1 times higher than the increase in other healthcare settings (+30.4%). In contrast, nonhealthcare work showed a decrease of claims during the pandemic (−11.7% from 2019 to 2020), which was due to greater reductions in other claims compared with the number of COVID-related claims. In 2021, increased claim numbers in all healthcare settings decreased and nursing care facilities showed levels similar to the prepandemic period.

In nursing care facilities, COVID-related claims accounted for 50.5% of claims in 2020; this proportion was much higher compared with the proportions in other healthcare (35.7%) or nonhealthcare settings (14.3%). For other non-COVID claims, there were reductions of claims in all settings during the pandemic period. In 2020, the percentage reduction was less in healthcare settings (−18.6% in nursing care facilities and −16.2% in other healthcare) than in nonhealthcare settings (−24.4%); however, in 2021, nursing facilities showed the largest percentage reduction of non-COVID claims (−22.8%) compared with 2019.

Annual claim rates for nursing care facilities were 8.02 per 100 workers in 2019, 13.9 in 2020, and 8.92 in 2021. These claim rates were much higher than the rates for other healthcare or nonhealthcare settings. The same trend over time was observed in other healthcare settings (4.20 in 2019, 5.58 in 2020, and 4.67 in 2021), but nonhealthcare settings showed reductions of the claim rate

TABLE 1 WC claims filed during 2019–2021 in California: Nursing care facilities and other settings.

Claim by setting	Number (%) of claims by year of Injury			% Change from 2019 to 2020	% Change from 2019 to 2021	Claim rate per 100 workers (Employment[a])			Rate change in 2019–2021 IRR (95% CI)
	2019	2020	2021			2019	2020	2021	
Nursing care facilities						(140,133)	(132,623)	(127,944)	
All claims	11,233	18,490 (100)	11,411 (100)	+64.6%	+1.6%	8.02	13.94	8.92	1.05 (0.56–2.00)
COVID-related claims	–	9346 (50.5)	2735 (24.0)	–	–	–	7.05	2.14	
Other claims	11,233	9144 (49.5)	8676 (76.0)	−18.6%	−22.8%	8.02	6.89	6.78	0.92 (0.85–0.99)
Other healthcare						(1,604,668)	(1,576,906)	(1,636,945)	
All claims	67,444	87,933 (100)	76,438 (100)	+30.4%	+13.3%	4.20	5.58	4.67	1.05 (0.80–1.39)
COVID-related claims	–	31,410 (35.7)	16,503 (21.6)	–	–	–	1.99	1.01	–
Other claims	67,444	56,523 (64.3)	59,935 (78.4)	−16.2%	−11.1%	4.20	3.58	3.66	0.93 (0.84–1.03)
Nonhealthcare						(15,638,444)	(14,408,453)	(14,957,808)	
All claims	640,758	565,558 (100)	603,584 (100)	−11.7%	−5.8%	4.10	3.93	4.04	0.99 (0.95–1.03)
COVID-related claims	–	80,875 (14.3)	62,946 (10.4)	–	–	–	0.56	0.42	–
Other claims	640,758	484,683 (85.7)	540,638 (89.6)	−24.4%	−15.6%	4.10	3.36	3.61	0.94 (0.81–1.09)
All industries						(17,383,245)	(16,117,982)	(16,722,697)	
All claims	719,435	671,981 (100)	691,433 (100)	−6.6%	−3.9%	4.14	4.17	4.13	1.00 (0.99–1.01)
COVID-related claims	–	121,631 (18.1)	82,184 (11.9)	–	–	–	0.75	0.49	–
Other claims	719,435	550,350 (81.9)	609,249 (88.1)	−23.5%	−15.3%	4.14	3.41	3.64	0.94 (0.81–1.08)

Note: Data Source: California Department of Industrial Relations, Workers' Compensation Information System.

Abbreviations: CI, confidence interval; IRR, incidence rate ratio; WC, workers' compensation.

[a]Average annual employment in California, except for federal government. Data source: California Employment Development Department, Quarterly Census of Employment and Wages.

during the pandemic period (4.10 in 2019, 3.93 in 2020, and 4.04 in 2021). In nursing care facilities, the rate of COVID-related claims was 2.14 per 100 workers in 2021 and 7.05 in 2020. These rates were 2.1–3.5 times higher than the rates of other healthcare settings and 5.1–12.6 times higher than the rates of nonhealthcare settings. Other non-COVID claims in nursing care facilities showed statistically significant reductions during 2019–2021, with an 8% decrease per year (IRR = 0.92, 95% CI 0.86–0.97).

3.2 | Demographic, job, and injury characteristics of claim cases

Table 2 shows the demographic and job characteristics of claim cases in nursing care facilities. For cases in 2020–2021, 79.5% were female; the age groups with the most claims were 45–54 years (22.8%) and 25–34 years (21.6%). Almost 60% of claims were made by new employees who were employed for 12 months or less (35.3%) and 13 months to 2 years (23.4%). Claims by occupation were most frequent among nursing assistants or other care aides (39.0%), followed by nurses (12.6%), housekeeping or environmental services (8.9%), and food services (8.7%). Compared with other claims, COVID claims were more common in male workers, younger workers, workers with higher job tenure, and among the occupational groups of nurses, housekeeping or environmental service workers, clinician, therapist or other care provider group, activity assistants, and mental health and social service workers.

Table 3 shows the injury characteristics of non-COVID claims cases by year in nursing care facilities. During the pandemic period, claims due to overexertion and bodily reaction—which was the most common cause—decreased by 17.9% in 2020 and 23.0% in 2021 compared with 2019. Claims due to exposures to harmful substances or environments showed the largest reductions in both 2020 (−40.6%) and 2021 (−38.1%) compared with 2019, whereas claims due to falls, slips, and trips showed the smallest reductions (−11.4–13.7%). The monthly number of claims by cause or event from 2019 to 2021 is presented in Figure 2. Although all other claims by nature of injury decreased during the pandemic period, mental stress or mental disorder claims increased in both years from 73 in 2019 to 104 in 2020 (+42.5%) and 92 in 2021 (+26.0%). Looking at the mental stress or mental disorder claims per month, the monthly claim rate change over the 3-year period was not statistically significant (IRR = 1.009, 95% CIs 0.994–1.024). Upper extremity claims, which were the most common, decreased by 21.2%–23.1% during the pandemic compared with 2019. Multiple body part injury claims showed the largest reductions from 2019 (−24.8% in 2020 and −34.9% in 2021).

4 | DISCUSSION

This study analyzed California WC claims data from 2019 to 2021 to assess the impact of the COVID-19 pandemic on occupational health risks in nursing care facility workers. We observed a large increase of claims in the first year of the pandemic period (+65% from 2019) due to COVID-related claims and then a decrease in 2021 to a level similar to pre-COVID. We also observed that mental stress or mental disorder claims increased during the pandemic period, whereas all other non-COVID claims decreased among nursing care facility workers.

After the COVID pandemic began, nursing care facilities were identified as highly vulnerable settings.[5–7] Our study findings confirmed the disproportionately higher risk of COVID infection among nursing care facility workers, particularly during the early pandemic period when there was limited knowledge of the new virus, limited control measures, and a greater shortage of PPE. In 2020, COVID-related claims accounted for 51% of all claims in California nursing care facilities and their COVID-related claim rate was 3.5 times higher than the claim rate among other healthcare workers and 12.6 times higher than the rate among nonhealthcare workers. The higher rates of COVID-related claims among healthcare workers including nursing care facility workers demonstrate the higher risks faced among healthcare workers, but could also be attributed in part to the California's WC Presumption (SB1159) enacted on September 17, 2020.[35] The California Senate Bill 1159 codified "an employee's illness related to coronavirus is an occupational injury and therefore eligible for WC benefits if specified criteria are met" and healthcare workers along with first responders met one of the criteria.[35] The presumption must have contributed to reducing barriers and facilitating WC filing among healthcare workers.

We hypothesized that working conditions during the pandemic such as increased physical and mental workload would increase occupational injury risks among nursing care facility workers. The very limited research available during the pandemic also suggested increased occupational accidents among health sector workers.[31] However, in our study, we observed decreases of non-COVID claims in nursing care facilities as well as in all other settings during the pandemic. Data from the US BLS also showed decreases of nonfatal occupational injuries reported in 2020 and 2021 compared with 2019 in all industries, including nursing care facilities, whereas occupational illnesses greatly increased, mostly due to respiratory illnesses.[36,37] These decreases may not directly translate into an actual reduction of occupational injury risk among those who were working on site during the pandemic. Instead, there can be several possible explanations.

First, the decreases may have been primarily due to shifts to huge increases of COVID-19 cases that occurred during the same time. Affected workers took time off from work for treatment, recovery, or quarantine, and therefore spent less time at work, resulting in overall less exposure time to occupational hazards. Second, during the pandemic, employee health services put priority on COVID case identification, data collection, and resources; thus, workers may have felt it easier to report COVID-related conditions than other work-related injuries if they experienced both at the same or similar time. Third, telework was implemented in many workplaces for social distancing; this change may have factored into reducing injury occurrences at workplaces. According to the BLS, 35.4% of

TABLE 2 Demographic and job characteristics of workers with WC claims filed during 2019–2021 in nursing care facilities in California.

Variable	Year 2019 All claims (n = 11,233)		Years 2020–2021 All claims (n = 29,901)		COVID-related claims (n = 12,081)		Other claims (n = 17,820)		COVID claim versus other claim
	N	%	N	%	N	%	N	%	Adjusted OR (95% CI)[b]
Gender									
Female	9186	81.8	23,757	79.5	9270	76.7	14,487	81.3	Ref
Male	1896	16.9	5734	19.2	2654	22.0	3080	17.3	1.39 (1.30–1.48)
Unknown	151	1.3	410	1.4	157	1.3	253	1.4	–
Age at the time of injury (years)									
16–24	1367	12.2	3348	11.2	1265	10.5	2083	11.7	Ref
25–34	2496	22.2	6462	21.6	2692	22.3	3770	21.2	0.99 (0.90–1.08)
35–44	1953	17.4	5525	18.5	2366	19.6	3159	17.7	0.99 (0.90–1.08)
45–54	2555	22.7	6817	22.8	2661	22.0	4156	23.3	0.79 (0.72–0.87)
55–64	2247	20.0	6086	20.4	2455	20.3	3631	20.4	0.78 (0.70–0.86)
65+	596	5.3	1594	5.3	614	5.1	980	5.5	0.67 (0.58–0.77)
Unknown or Invalid	19	0.2	69	0.2	28	0.2	41	0.2	–
Mean, SD (years)									
Time from hire to injury									
12 months or less	4358	38.8	10,568	35.3	3848	31.9	6720	37.7	Ref
13 months to 2 years	2422	21.6	7005	23.4	2811	23.3	4194	23.5	1.21 (1.14–1.30)
3–4 years	1130	10.1	3300	11.0	1457	12.1	1843	10.3	1.49 (1.37–1.62)
5–9 years	1021	9.1	3254	10.9	1399	11.6	1855	10.4	1.43 (1.32–1.56)
10+ years	1507	13.4	4476	15.0	2226	18.4	2250	12.6	2.06 (1.91–2.24)
Unknown or Invalid	795	7.1	1298	4.3	340	2.8	958	5.4	–
Median, IQR (years)									
Occupation									
Nursing assistant or other care aide[a]	4611	41.0	11,661	39.0	4643	38.4	7018	39.4	Ref
Licensed practical/vocational nurse	654	5.8	2204	7.4	1171	9.7	1033	5.8	1.74 (1.58-1.91)
Registered nurse	466	4.1	1541	5.2	835	6.9	706	4.0	1.84 (1.65–2.05)
Nursing, other (manager or nonspecified)	484	4.3	1214	4.1	302	2.5	912	5.1	0.50 (0.43–0.57)
Food services	939	8.4	2603	8.7	961	8.0	1642	9.2	0.82 (0.75–0.90)
Housekeeping, environmental services	779	6.9	2676	8.9	1177	9.7	1499	8.4	1.16 (1.06–1.27)
Administrative, care/program manager	762	6.8	2308	7.7	978	8.1	1330	7.5	1.05 (0.95–1.15)
Clinician, therapist, other care provider	146	1.3	618	2.1	369	3.1	249	1.4	2.05 (1.73–2.42)
Activity assistant	123	1.1	425	1.4	251	2.1	174	1.0	2.21 (1.80–2.71)
Medical/medication assistant/technician	90	0.8	265	0.9	92	0.8	173	1.0	0.83 (0.64–1.07)
Other technician	127	1.1	359	1.2	32	0.3	327	1.8	0.13 (0.09–0.19)

(Continues)

TABLE 2 (Continued)

Variable	Year 2019 All claims (*n* = 11,233)		Years 2020–2021 All claims (*n* = 29,901)		COVID-related claims (*n* = 12,081)		Other claims (*n* = 17,820)		COVID claim versus other claim
	N	%	*N*	%	*N*	%	*N*	%	Adjusted OR (95% CI)[b]
Mental health or social services	134	1.2	318	1.1	190	1.6	128	0.7	2.14 (1.69–2.70)
Driver, transportation	41	0.4	86	0.3	36	0.3	50	0.3	0.96 (0.62–1.48)
Other or nonspecified	1877	16.7	3623	12.1	1044	8.6	2579	14.5	0.60 (0.55–0.66)

Note: Data Source: California Department of Industrial Relations, Workers' Compensation Information System.

Abbreviations: CI, confidence interval; OR, odds ratio; WC, workers' compensation.

[a]Patient care technician, patient care assistant, caregiver, memory care, restorative aid, personal care, direct care, orderly, transporter, and so on.

[b]Adjusted for all other variables in the table.

TABLE 3 Injury characteristics of WC claims filed during 2019–2021 in nursing care facilities in California.

	Year 2019 All claims		Year 2020 Claims not related to COVID		% Change from 2019 to 2020	Year 2021 Claims not related to COVID		% Change from 2019 to 2021
	N	%	*N*	%		*N*	%	
Total	11,233	100	9144	100	−18.6%	8676	100	−22.8%
Cause or event								
Overexertion and bodily reaction	4415	39.3	3623	39.6	−17.9%	3400	39.2	−23.0%
Contact with objects and equipment	2436	21.7	1866	20.4	−23.4%	1787	20.6	−26.6%
Falls, slips, or trips	1651	14.7	1424	15.6	−13.7%	1462	16.9	−11.4%
Violence and other injuries by persons	1119	10.0	936	10.2	−16.4%	785	9.0	−29.8%
Exposure to harmful substances/ environments	436	3.9	259	2.8	−40.6%	270	3.1	−38.1%
Transportation incidents	96	0.9	61	0.7	−36.5%	79	0.9	−17.7%
Other/unclassified	1080	9.6	975	10.7	−9.7%	893	10.3	−17.3%
Nature								
Strain, sprain, tear	4796	42.7	4054	44.3	−15.5%	3868	44.6	−19.3%
Contusion	1577	14.0	1364	14.9	−13.5%	1312	15.1	−16.8%
Puncture/laceration	1262	11.2	955	10.4	−24.3%	823	9.5	−34.8%
Inflammation	505	4.5	335	3.7	−33.7%	283	3.3	−44.0%
Multiple injuries (physical and psychological)	416	3.7	385	4.2	−7.5%	320	3.7	−23.1%
Burn	173	1.5	130	1.4	−24.9%	138	1.6	−20.2%
Fracture/dislocation	162	1.4	102	1.1	−37.0%	147	1.7	−9.3%

TABLE 3 (Continued)

	Year 2019 All claims		Year 2020 Claims not related to COVID		% Change from 2019 to 2020	Year 2021 Claims not related to COVID		% Change from 2019 to 2021
	N	%	*N*	%		*N*	%	
Dermatitis	108	1.0	65	0.7	−39.8%	50	0.6	−53.7%
Foreign body	106	0.9	79	0.9	−25.5%	52	0.6	−50.9%
Infection/ contagious disease (non-COVID)	96	0.9	35	0.4	−63.5%	20	0.2	−79.2%
Mental stress/ disorders	73	0.6	104	1.1	**42.5%**	92	1.1	**26.0%**
Crushing	73	0.6	58	0.6	−20.5%	76	0.9	**4.1%**
Other	1886	16.8	1478	16.2	−21.5%	1495	17.2	−20.7%
Body part injured								
Head	775	6.9	617	6.7	−20.4%	566	6.5	−27.0%
Neck	153	1.4	116	1.3	−24.2%	117	1.3	−23.5%
Shoulder	771	6.9	702	7.7	−8.9%	653	7.5	−15.3%
Upper extremities excluding shoulder	3150	28.0	2482	27.1	−21.2%	2421	27.9	−23.1%
Lower back	1584	14.1	1419	15.5	−10.4%	1254	14.5	−20.8%
Truck excluding lower back	713	6.3	662	7.2	−7.2%	647	7.5	−9.3%
Lower extremities	1546	13.8	1236	13.5	−20.1%	1364	15.7	−11.8%
Multiple	2541	22.6	1910	20.9	−24.8%	1653	19.1	−34.9%

Note: Data Source: California Department of Industrial Relations, Workers' Compensation Information System.

Abbreviation: WC, workers' compensation.

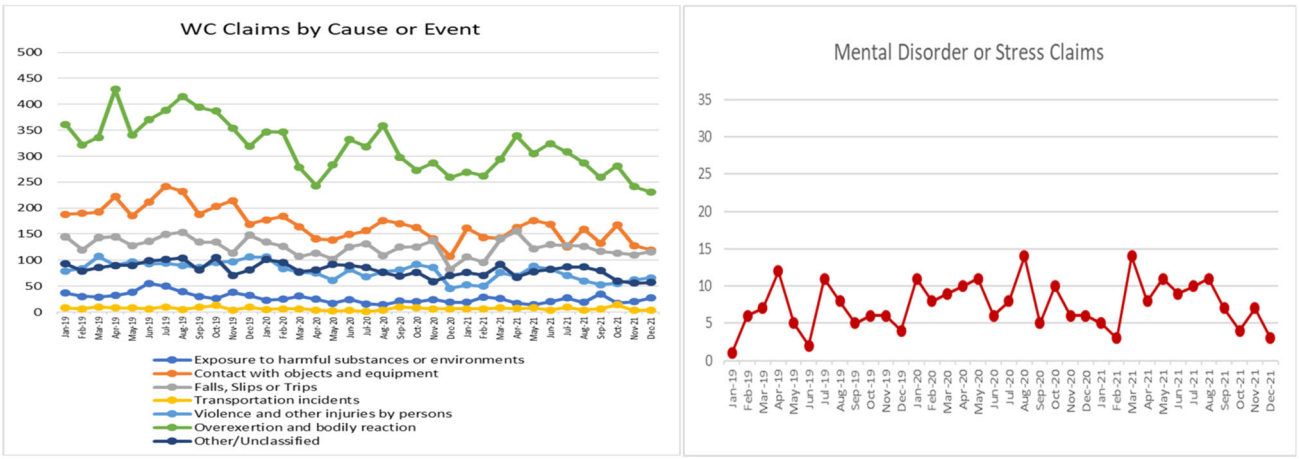

FIGURE 2 Non-COVID workers' compensation (WC) claims filed during 2019-2021 in California nursing care facilities: (a) claims by cause or event and (b) mental disorder or stress claims. Data Source: California Department of Industrial Relations, Workers' Compensation Information System.

employed people in the US teleworked in May 2020, and the teleworking percentage decreased over time, with 11.1% in December 2021.[38] Telework, however, applied less to healthcare workers as essential workers. According to the 2021 Business Response Survey to the Coronavirus Pandemic, 18.3% of workers in healthcare and social assistance sector reported doing some telework, which was lower than the telework percentage of 21.8% in all US workers.[39] Fourth, during the pandemic, there were decreases in patient census in healthcare,[40] including nursing care facilities.[41] Thus, workers may have reduced their work hours accordingly, leading to less exposure to workplace hazards. Lastly, more frequent or regular use of PPE such as gloves, masks, respirators, face shields, and protective garments may have contributed to preventing some types of injuries or illnesses (e.g., respiratory exposure, contact with objects, or chemicals). All these situations combined may have contributed to the reduction of occupational injuries and claims rates in nursing care facilities.

One main finding of this study is the confirmation of the huge psychological burden and increased mental health risks among healthcare workers, which were created and heightened by the COVID-19 pandemic. As noted above, only stress and mental disorder claims increased in both years while other types of claims decreased during the pandemic. There has been extensive research in the past three years reporting a high prevalence of stress, anxiety, depression, burnout, and other psychological as well as physical symptoms among healthcare workers during the COVID-19 pandemic.[11–23] It should be noted that the claims data used in our study were filed claims, not accepted claims. Compared with physical injury claims, mental disorder or stress claims can be more difficult in proving work-relatedness and, thus, less likely to be accepted. Therefore, the magnitude of filed claims for stress and mental disorders can still be an underestimate, but may better reflect the actual extent of workers affected by COVID than accepted claims and can be helpful to better quantify the need for mental health support for workers.

In examining job and demographic characteristics of claim cases, we found no meaningful differences between pre-pandemic and pandemic periods. One notable finding in our study is the high incidence of occupational injuries among new employees or workers with less job tenure. We found that about 60% of WC claims were made by workers with job tenure of two years or less; the similar result was found for COVID-related claims as well. Consistent with evidence in the literature,[42–44] our study findings indicate a need for special attention to workers with less job experience to reduce their occupational health risks.

Our study findings have several methodological limitations that require caution in interpreting. WC claims cases represent more severe occupational injuries or illnesses requiring medical treatment or indemnity benefits; therefore, minor conditions or near-miss cases may not be captured in these data. Furthermore, as barriers exist in workers' reporting of their occupational injuries or illnesses,[45] there can be underreporting, particularly among workers in disadvantaged situations. Therefore, our findings may underestimate the true magnitude of occupational injuries during the COVID-19 pandemic. Additionally, limited sociodemographic information was available from WC data, which limited the characterization of cases in our analysis. Finally, the WC data collected for administrative purposes presented some technical challenges in data analysis. For example, some cases had discrepancies between the industry code and class code or between nature of injury and injury description, which required additional manual reviews. For occupation, we conducted coding based on the narrative descriptions and it was difficult to determine occupation categories for cases with insufficient or mixed descriptions, word truncations, unclear abbreviations, or typos. These might have led to some extent of misclassification in our data analysis. Using standard occupation codes in data submission can be recommended to improve the data utility.

5 | CONCLUSION

Our findings show that nursing care facilities were more vulnerable and more severely affected by the COVID-19 pandemic than other healthcare settings or nonhealthcare industries. Nursing care facilities experienced a greater increase of WC claims as well as a higher percentage of COVID-related claims than other industries during the pandemic. For occupational injury risk during the pandemic, we observed reductions of non-COVID claims and did not find evidence of increased risk of occupational injury, except for stress or mental disorders.

Our findings from WC claims data analyses indicate an overall decrease of work-related injury rates at the population level, but may not have captured the increased occupational exposures and burden experienced by individual workers who were working on site during the pandemic. The latter point may be somewhat reflected in the finding of increased stress or mental disorder claims. Our study findings indicate a clear need to address psychological stress and mental health during a pandemic among healthcare workers, particularly for workers in more vulnerable settings such as nursing care facilities.

AUTHOR CONTRIBUTIONS

Soo-Jeong Lee conceptualized and designed the study, obtained the data, conducted data analysis and interpretation, and wrote and revised the manuscript. Younghee Yun and Jeehyun Hwang participated in the data analysis and contributed to critical revision of the manuscript. Soson Jong contributed to critical revision of the manuscript. All authors approved the final version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

ACKNOWLEDGMENTS

We acknowledge the California Department of Industrial Relations, Division of Workers Compensation for providing the data for our

study. This study was supported by the following sponsors: US Bureau of Health Workforce, Health Resources and Services Administration (U81HP26494).

CONFLICT OF INTEREST STATEMENT

The authors declare no conflicts of interest.

DISCLOSURE BY AJIM EDITOR OF RECORD

John Meyer declares that he has no conflict of interest in the review and publication decision regarding this article.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from California Department of Industrial Relations. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the author(s) with the permission of California Department of Industrial Relations.

ETHICS STATEMENT

The study was approved by the Committee on Human Research at the University of California, San Francisco (UCSF) and the California State Committee for the Protection of Human Subjects (CPHS).

DISCLAIMER

The findings and conclusions in this report are those of the authors and do not represent the views of the California Department of Industrial Relations, Division of Workers Compensation.

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How to cite this article: Lee S-J, Yun Y, Hwang J, Jong S. Impact of COVID-19 on occupational injuries and illnesses among nursing care facility workers: Analysis of California workers' compensation data, 2019–2021. *Am J Ind Med*. 2023;66:965-976. doi:10.1002/ajim.23531