

Filing a Workers' Compensation Claim for Low Back Pain and Associated Factors

Analysis of 2015 National Health Interview Survey

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Objective: The aim of this study was to examine the degree of reporting work-related low back pain (LBP) by workers' compensation (WC) claim filing and associated factors among US workers. **Methods:** We conducted multivariable logistic regression using the 2015 National Health Interview Survey data. **Results:** Among 1203 US workers with self-reported work-related LBP diagnosis, only 19.6% filed for WC. Compared with non-Hispanic White workers, Black, Asian, and Hispanic workers were less likely to file for WC. Workers' compensation filing was less frequent among workers in independent work arrangement and who stopped working, changed jobs, or made a change in work and more frequent among workers 45 to 64 years of age and having high LBP frequency. **Conclusions:** Our study findings suggest underreporting of work-related LBP to the WC system is common. Barriers to WC filing should be addressed especially for racial/ethnic minorities and independent workers.

Keywords: low back pain, underreporting, workers compensation

Low back pain (LBP) has been identified as one of the most prevalent occupational health problems, with significant implications for workers and society. According to the Bureau of Labor Statistics, one third of work-related injuries or illnesses requiring days away from work are musculoskeletal disorders, and LBP accounts for the largest portion of musculoskeletal disorders.¹ As a major contributor to disability, LBP significantly limits the dexterity and mobility of workers, resulting in reduced productivity, early retirement, and subsequent financial burden on society.² Incidence of LBP is often underreported because of workers' doubts about eligibility for benefits, time and financial burdens, and work-relatedness may be difficult to prove given the chronic nature of LBP.³ Nonetheless, it is estimated that LBP annually costs approximately 635 billion dollars, including direct medical costs and indirect costs such as productivity loss in the United States.⁴

Workers' compensation (WC) claim data are often used as a source to identify the magnitude and the trend of occupational injuries and illnesses.⁵ Workers' compensation programs aim at protecting injured workers from financial losses and further disability by providing medical treatment, wage replacement for lost time, and a means to facilitate timely return to work.⁵ However, many researchers pointed out that WC claim data only capture a fraction of occupational injuries or illnesses, and a substantial number of workers face obstacles for filing a WC claim.⁶ According to previous studies, WC claim filing rates ranged from 8.7% to 60%.^{3,5,7-9}

Various factors, such as injury severity and workplace psychosocial factors, contribute to reporting of work-related injuries or illnesses. In a cohort study of 1158 general workers in Michigan, Biddle and Roberts⁸ found that only 31.5% of workers who were identified as having work-related pain had filed a WC claim, and filing a WC claim was associated with severity of injuries or illnesses, workers' fear of reporting consequences, and having other medical insurance. Rosenman et al⁷ analyzed WC data in Michigan and identified that the strongest predictor of filing a WC claim was severity of reported condition resulting in missed work of 7 days or more. The severity of injuries or illnesses was also identified as a significant factor for filing a WC claim in the study of Morse et al¹⁰ and Shannon and Lowe.⁵ In Qin et al's³ study of 2639 nursing home workers in the northeastern United States, only 8.7% of workers who had LBP in the past 3 months filed a claim, and pain severity and psychosocial work environment were associated with workers' decision to file a WC claim. Safety climate is also positively related with injury reporting by workers. A study that analyzed reportable Occupational Safety and Health Administration injury data and medical claims data from 38 companies contracted to work at a large construction site in the northwestern United States, found that organizations with low safety climate had significantly higher underreporting rates of occupational accidents compared with organizations with high safety climate.¹¹

The variability of reporting magnitude is considerable because the WC filing eligibility differs from agency to agency and from state to state. Furthermore, there is very limited research studying underreporting of LBP to WC using national data. The purpose of this study was to estimate the level of underreporting of LBP to WC and identify the contributing factors to the underreporting of LBP.

METHODS

Data Source

This study used the 2015 National Health Interview Survey (NHIS) data, which included the Occupational Health Supplements. The NHIS is a nationally representative survey on the health of the non-institutionalized population in the United States. The NHIS is a cross-sectional, in-person interview survey for US households conducted annually since 1957. The survey sample consists of approximately 35,000 household including 103,789 persons across 50 states, selected by multistage area probability sampling. The 2015 NHIS adult sample included 33,672 adults 18 years or older. This study included those who met the following 3 criteria: 1) currently employed adults who answered that they were working for pay at a job or business, or with a job or business but not at work in the employment status last week; 2) those who had LBP in the past 3 months; and 3) those who have ever been told by a doctor or health care professional that their LBP was work related.

Study Variables and Measures

Reporting of LBP to WC Programs

The dependent variable in this study was LBP filing for WC. Respondents were asked to indicate whether they have ever filed a

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WC claim for LBP as yes or no. Respondents were also asked whether they have ever been told by a doctor or health care professional that LBP is work related, and those who gave an affirmative answer were considered reportable cases.

Demographics and Job Characteristics

The demographics included age, sex, marital status, race/ethnicity, and education. Job characteristics included job tenure (less than 1 year, 1–4 year(s), 5–9 years, and 10 or more years), occupation category (management; business and financial occupations; computer, engineering, and science occupations; education, legal, community service, art, and media occupations; health care practitioners and technical occupations; service occupations; sales and related occupations; office and administrative support occupations; farming, fishing, and forestry occupations; construction and extraction occupations; installation, maintenance, and repair occupations; production occupations; transportation and material moving occupations), size of workplace (less than 10 employees, 10–49 employees, 50–249 employees, 250–999 employees, and 1000 employees or more), and work arrangement (permanent, temporary, independent, and on-calls or nonspecific type of work). Temporary workers referred to workers paid by a temporary agency, and independent workers included independent contractors, independent consultants, or freelance workers.

Psychosocial Work Factors

Psychosocial work factors included job demands, job control, supervisor support, fear of job loss, and safety climate. Each psychosocial work variable was measured by a single item as follows: “I have enough time to get the job done” (job demand), “My job allows me to make a lot of decision on my own” (job control), “I can count on my supervisor or manager for support when I need it” (supervisor support), and “The health and safety of workers is a high priority with management where I work” (safety climate). The questions used a 4-point scale (1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree). Reverse coding was applied to job demand, job control, supervisor support, and safety climate so that higher values indicate higher psychosocial scores. Regarding fear of job loss, respondents were asked to indicate their worries about losing their job as yes or no.

Low Back Pain Status and Consequences

Low back pain frequency and severity were used to describe LBP status. Respondents were asked to denote their LBP frequency and severity rating from 1 to 3 during the past 3 months, with higher scores meaning more frequent and more severe LBP symptoms. To assess LBP consequences, respondents were asked to indicate whether they had to stop working, change jobs, or made a major change in their work or activity because of LBP and how many full days they missed from work because of the LBP. Considering that the eligibility for WC temporary disability benefit occurs when workers are unable to do their usual job for more than 7 days, the days of missed work was dichotomized into more than 7 days or 7 days and less.¹²

Data Analysis

All study variables were described by WC filing status using descriptive statistics such as frequency, percentage (%), mean, and SD. Chi-square tests or two-tailed *t* tests with 95% significance level were used to compare demographic variables, job characteristics, psychosocial work factors, and LBP status and consequences between workers who filed a WC claim and those who did not. Multivariable logistic regressions were conducted to investigate the contributing factors filing a WC claim for LBP. After checking multicollinearity, the variables with *P* value less than 0.10 from the bivariate analysis were included in multivariable analyses. For multivariable analysis, the initial model included sociodemographics and job characteristics (model 1). In model 2, LBP

status was added to model 1. Model 3 further added LBP consequence, and model 4 added psychosocial work factors to model 3. The results were reported as adjusted odds ratio (aOR) and 95% confidence interval (CI). Data analysis was performed using the STATA version 16.0 (StataCorp, College Station, Texas).

RESULTS

Sample Characteristics

Among the study sample (*N* = 1203), 236 workers (19.6%) filed a WC claim (Table 1). The mean age of the study sample was 45.3 years, and the mean duration of work was 9.3 years; workers 45 to 64 years of age (23.7%) and having less than 1 year of job tenure (22.5%) had the highest filing rate. Compared with other racial/ethnic groups, White (23.5%) and Asian (27.3%) workers made up a larger proportion of those who filed a WC claim. Temporary workers accounted for the highest WC claim filing rate (28.2%). Workers with occupations of office and administrative support (29.5%), production (24.0%), and installation, maintenance, and repair (23.3%) had the highest WC claim filing rates. On the other hand, workers with occupations farming, fishing, and forestry (10.0%) had the lowest WC claim filing rate among all occupations. For LBP consequences, workers who stopped working, changed jobs, or made a change in work (27.4%) and those who missed from work more than 7 days (29.7%) showed a higher WC claim filing rate than their counterparts.

Low Back Pain Status and Consequences and Psychosocial Work Factors by WC Claim Filing Status

Table 2 provides comparisons of LBP status and consequences and psychosocial work factors between workers who filed a WC claim and those who did not. Significant differences in those variables were observed between the 2 groups. Compared with the nonfiling group, the filing group had a higher frequency of LBP (*P* < 0.001), higher severity (*P* = 0.003), and more lost workdays due to LBP (*P* = 0.013). The WC claim filing group also had significantly higher proportions of workers with fear of job loss (*P* = 0.058) and lower score of safety climate (*P* = 0.062) compared with the non-WC claim filing group.

Factors Associated With Filing a WC Claim

Table 3 presents multivariable analysis results on factors associated with filing a WC claim. In model 1, workers 45 to 64 years of age were more likely to file a WC claim than workers 18 to 29 years of age (aOR = 2.26; 95% CI, 1.35–3.76). Compared with non-Hispanic White workers, Hispanic (aOR = 0.51; 95% CI, 0.34–0.78), non-Hispanic Black (aOR = 0.47; 95% CI, 0.28–0.78), and non-Hispanic Asian (aOR = 0.39; 95% CI, 0.16–0.93) workers were less likely to file a claim. Independent workers (aOR = 0.40; 95% CI, 0.23–0.69) were also less likely to file a WC claim than permanent workers. After adding LBP status to model 2, age, race/ethnicity, and work arrangement remained significant and there was a positive association between filing a WC claim and increased LBP frequency (aOR = 1.64; 95% CI, 1.35–1.96). In model 3 adding LBP consequence to model 2, all the significant variables in model 2 still presented significant associations, and workers who stopped working, changed jobs, or made a change in work because of LBP (aOR = 0.61; 95% CI, 0.39–0.95) were less likely to file a WC claim. In final model 4 adding psychosocial work factors, neither safety climate nor job fear showed significant associations with WC filing, whereas LBP frequency, LBP consequence, age, race/ethnicity, and work arrangement remained significant.

DISCUSSION

This study examined the degree of underreporting of LBP cases to WC insurance programs using a nationally representative sample and identified important factors that may affect workers' decision

TABLE 1. Sample Characteristics of Workers 18 or Older Who Had Work-Related LBP Confirmed by a Doctor or Health care Professional and Subsequent Consequence of LBP: Analysis of 2015 National Health Interview Survey

	Workers With Work-Related LBP		Filed a WC Claim		P
	(N = 1203)		(n = 236)	% ^a	
	n		n	% ^a	
Sociodemographics					
Age, y					0.003
18–29	161		20	12.4	
30–44	377		63	16.7	
45–64	599		142	23.7	
65 or more	66		11	16.7	
Sex					0.229
Male	682		142	20.8	
Female	521		94	18.0	
Marital status					0.140
Married	525		93	17.7	
Not married	677		143	21.1	
Race/ethnicity					<0.001
Hispanic	242		28	13.3	
Non-Hispanic, White	719		169	23.5	
Non-Hispanic, Black	153		22	12.9	
Non-Hispanic, Asian	55		3	27.3	
Non-Hispanic, Other	34		6	10.3	
Education					0.189
Less than college	351		75	21.4	
Some college	717		142	19.8	
More than college	135		19	14.1	
Job characteristics					
Job tenure, y					0.408
Less than 1	173		39	22.5	
1–4	333		56	16.8	
5–9	233		49	21.0	
10 or more	463		91	19.7	
Work arrangement					0.009
Permanent	957		198	20.7	
Temporary	39		11	28.2	
Independent	157		16	10.2	
On-calls or nonspecific type of work	47		10	21.3	
Occupation category					0.261
Management, business, financial	128		26	20.3	
Computer, engineering, science	32		7	21.9	
Education, legal, community service, art, media	84		14	16.7	
Health care practitioners, technical	75		15	20.0	
Service	287		44	15.3	
Sales and related	91		17	18.7	
Office and administrative support	112		33	29.5	
Farming, fishing, and forestry	10		1	10.0	
Construction and extraction	121		24	19.8	
Installation, maintenance, repair	60		14	23.3	
Production	79		19	24.0	
Transportation and material moving	112		19	17.0	
Size of workplace					0.230
Less than 10 employees	372		59	15.9	
10–49 employees	296		57	19.3	
50–249 employees	265		60	22.6	
250–999 employees	135		28	20.7	
1000 employees or more	111		25	22.5	
LBP consequences					
Stopped working, changed jobs, or made a change in work					0.016
Yes	135		37	27.4	
No	1068		199	18.6	
Missed work more than 7 d					0.113
Yes	37		11	29.7	
No	1160		223	19.2	

LBP, low back pain; WC, workers' compensation.

Numbers in bold indicate significant at $P < 0.05$.^aRow percentage was applied.

TABLE 2. Comparison of LBP and Psychosocial Work Factors by WC Filing Status Among Workers With Work-Related LBP Confirmed by a Health Care Professional: Analysis of 2015 National Health Interview Survey

	Total (N = 1203)		Filing WC (n = 236)		Not Filing WC (n = 967)		P
	Mean	SD	Mean	SD	Mean	SD	
LBP status and consequences							
LBP frequency (1–3)	1.6	0.8	1.9	0.9	1.6	0.8	<0.001
LBP severity (1–3)	1.9	0.7	2.1	0.7	1.9	0.7	0.003
Missed days from work due to LBP	1.6	8.6	2.9	11.9	1.3	7.6	0.013
Psychosocial work factors							
Job demand (1–4)	1.9	0.9	2.0	0.9	1.9	0.8	0.776
Job control (1–4)	3.2	0.8	3.3	0.7	3.2	0.8	0.441
Supervisor support (1–4)	3.1	0.8	3.1	0.9	3.1	0.8	0.815
Safety climate (1–4)	3.4	0.8	3.3	0.9	3.4	0.8	0.062
Fear of job loss (yes) (n, %)	251	20.9	60	25.4	191	19.8	0.058

LBP, low back pain; WC, workers' compensation.
Numbers in bold indicate significant at $P < 0.05$.

leading to filing a WC claim for their LBP. We examined WC filing among a general working population with self-reported work-related LBP diagnosis and observed that a substantial proportion of workers (80.4%) did not file a WC claim. This level of underreporting is higher than that of previous study findings on underreporting.^{7,8} The magnitude of underreporting may vary by the case definition and method used in each study. Physicians determine whether work caused a disorder by considering the timing of onset of symptoms, work factors, nonwork factors, and patient's opinion about work-relatedness of the problem.¹³ Our study defined eligible workers for filing a WC claim as those who have ever been told by a doctor or health care professional that their LBP was work related. Rosenman et al⁷ investigated

general workers having self-reported work-related musculoskeletal disorder diagnosis and reported that 74.2% of the workers did not file for WC. However, when they measured underreporting among “workers who missed more than seven consecutive days due to work-related musculoskeletal pain,” the underreporting rate decreased to 25%.⁷ Similarly, Biddle and Roberts found that 68.5% of general workers with self-reported work-related musculoskeletal disorder diagnosis and 27% of workers who missed more than seven consecutive days due to the disorders did not file for WC.⁸

We identified that WC claim filing for LBP increased with LBP frequency. Previous studies have indicated that severity of an injury or illness is the strongest predictor of WC filing,^{5,7,10} but there is very

TABLE 3. Multivariable Analysis on Factors Associated With Filing a WC Claim Among Workers Who Had Low Back Pain Confirmed by a Doctor or Health care Professional

	Filing a WC Claim							
	Model 1		Model 2		Model 3		Model 4	
	(n = 1200)		(n = 1197)		(n = 1197)		(n = 1051)	
	OR	95% CI	OR	95% CI	OR	95% CI	OR	95% CI
Age (ref. 18–29 y)								
30–44 y	1.52	0.88–2.62	1.49	0.86–2.6	1.51	0.87–2.63	1.56	0.88–2.74
45–64 y	2.26	1.35–3.76	2.22	1.32–3.73	2.29	1.37–3.86	2.25	1.32–3.82
65 y or more	1.53	0.67–3.47	1.43	0.62–3.29	1.46	0.63–3.36	1.99	0.84–4.7
Race/ethnicity (ref. Non-Hispanic White)								
Hispanic	0.51	0.34–0.78	0.56	0.37–0.85	0.55	0.36–0.85	0.54	0.35–0.84
Non-Hispanic, Black	0.47	0.28–0.78	0.50	0.3–0.83	0.49	0.29–0.82	0.46	0.27–0.78
Non-Hispanic, Asian	0.39	0.16–0.93	0.41	0.17–0.99	0.40	0.17–0.98	0.35	0.13–0.91
Non-Hispanic, Other	1.24	0.56–2.75	1.10	0.48–2.49	1.12	0.49–2.56	1.06	0.43–2.59
Work arrangement (ref. permanent)								
Temporary	1.48	0.72–3.08	1.52	0.73–3.18	1.49	0.71–3.13	1.64	0.75–3.61
Independent	0.40	0.23–0.69	0.37	0.21–0.64	0.35	0.2–0.61	0.37	0.17–0.81
On-calls or nonspecific type of work	0.90	0.44–1.88	0.92	0.43–1.93	0.89	0.42–1.88	0.93	0.34–2.52
Low back pain frequency			1.64	1.35–1.96	1.60	1.33–1.93	1.65	1.36–2.01
Low back pain severity			1.10	0.88–1.37	1.06	0.85–1.33	1.07	0.84–1.35
Stopped working, changed jobs, or made a change in work (yes)					0.61	0.39–0.95	0.59	0.36–0.95
Safety climate							0.92	0.76–1.12
Fear of job loss (yes)							1.22	0.83–1.79

Model 1 includes age, race/ethnicity, and work arrangement.

Model 2 adds low back pain severity and frequency to model 1.

Model 3 adds stopped working, changed jobs, or made a change in work to model 2.

Model 4 adds safety climate and fear of job loss to model 3.

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

Numbers in bold indicate significant at $P < 0.05$.

limited research that showed a significant association of symptom frequency with WC filing. Interestingly, our study found that LBP frequency was a significant factor for WC filing, but LBP symptom severity was not. Furthermore, employees who cannot work because of the injury or illness are entitled to WC benefits. The minimum number of lost workdays for WC benefits varies by states (eg, 3 days in California, 7 days in Michigan). As a more conservative approach, we selected 7 days for the cutoff in our examination and found no significant association between missing work more than 7 days and WC filing. These findings indicate that workers may be hesitant to report LBP and file for WC unless the pain experience is frequent, even if their pain is severe enough to make a change in their work that they usually do. The concern around workers' moral hazard behaviors, which suggests that workers may abuse the WC system by exaggerating their injuries or illness in an effort to increase benefits, has been frequently raised by employers as an area of concern. Our study findings provide opposing evidence to the workers' moral hazard behavior notion.

In our study, the experience that stopped working, changed jobs, or made a change in work was negatively associated with filing a WC claim for LBP. This result is consistent with previous study. Ruseckaite and Collie¹⁴ analyzed the repeated WC claims of 188,402 injured workers in Australia and found that those who changed their working conditions such as industry and occupation due to the injury were less likely to file a WC claim again. Safety or return to work policies and practices, psychosocial work environment, and relative risk of injury or illness can be varied by industry and occupation, and in turn, those factors may affect workers' claiming behavior. This finding indicates that workers who stopped working, changed jobs, or made a change in work may have experienced symptom improvement for their work-related injuries, or they were discouraged by the new working environment to file a WC claim.

Independent work arrangement also influenced workers' decision to file for WC. The definition of employee in the WC system refers to a worker who performs work under the control of an employer or management.¹⁵ Because independent workers such as independent contractors, independent counselors, and freelancers are self-employed, they are not covered under an employer's WC insurance program and may not have WC coverage of their own.¹⁶ Some independent workers purchase WC insurance policies for their own coverage or a job contract may require proof of coverage, but most are not covered by WC insurance. Our study findings show the vulnerability of independent workers in managing a work-related injury or illness.

Our finding suggested that racial or ethnic minority workers face more barriers to filing WC. Racial or ethnic minority workers often have higher risk of workplace injuries and poor health outcomes after experiencing work-related injury or illness than their White counterpart.^{17,18} Despite controlling for occupations and LBP status and consequences, we still observed racial or ethnic differences in filing for WC in our study. A number of evidence supported the vulnerability of racial or ethnic minority for reporting work-related injury or illness. In a study of Boden et al.,¹⁹ the odds of reporting sharp injury to occupational health services data were 11 times higher among non-Hispanic White than among other race/ethnicity. Scherzer and Wolfe²⁰ conducted in-depth and semistructured interviews with 38 injured workers mostly consisting of racial or ethnic minorities and found that financial concern, little knowledge of reporting process, and limited English proficiency prevent them from filing a WC claim.

We also found that workers 45 to 64 years of age were more likely to file a WC claim than workers 18 to 29 years of age. Our finding is consistent with previous study findings that increased age was associated with WC filing for work-related injuries or illnesses.⁸ Older workers generally have more preexisting conditions than younger workers.²¹ In addition, older workers generally have a lower injury and illness rate than younger workers, but their injuries are often more severe and require more time off for recovery. Yet, our study found an independent relationship between WC filing and age after adjustment

for LBP severity variables. Workers 45 to 64 years of age have longer job tenure and more life experiences than workers 18 to 29 years of age and may have more awareness of reporting requirements for work-related injuries or more knowledge of the WC system.²² In addition, less concern for future employment of older workers may play a role to facilitate WC filing among workers aged 45 to 64 years.

This study had several limitations. First, our study findings were based on self-reported data, which may be subject to reporting and recall biases. The information on the diagnosis of work-related LBP obtained from self-report may not be as accurate as the information directly from obtained from doctors. However, according to a longitudinal study following participants of the 2010 Labor Force Survey, doctors determined that 77% of self-reported cases of work-related illness cases were generally reliable.²³ Furthermore, as this study limited the sample to workers who objectively confirmed that their LBP is work related and measured LBP status and consequences during the past 3 months, recall bias is less likely to affect the results. Second, because of the healthy worker survival effect, which is bias that can occur in occupational research when currently employed workers tend to be healthier than those who leave the workplace, the level of underreporting of work-related LBP to WC insurance programs might have been underestimated in this study. Lastly, a cross-sectional design used in this study impaired the ability to establish a causal relationship.

CONCLUSIONS

Underreporting of work-related injuries or illnesses is a well-identified issue in occupational health practices and research. Our findings indicated that a substantial proportion of workers experiencing LBP face barriers to filing for WC, and multiple factors such as age, race/ethnicity, work arrangement, LBP frequency, and LBP consequence involving stopped working, changed jobs, made a change in work can affect these workers to file for WC. Our findings also suggest that vulnerable workers, such as racial/ethnic minorities and those in independent work arrangements, are less likely to receive WC benefits. Unfortunately, many of these risk factors are often combined. For example, many racial/ethnic minorities work as independent contractors. Encouragement for prompt reporting of work-related injuries and illnesses to WC programs, while enhancing safety communications and empowering vulnerable workers, is needed for workers to reduce further disability and facilitate them to return to work.

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