

Paid Sick Leave and Self-Reported Depression and Anxiety: Evidence From a Nationally Representative Longitudinal Survey

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Introduction: The objective of this study was to explore the association between access to paid sick leave (AtPSL) and self-reported feelings of depression and anxiety in a nationally representative U.S. working population.

Methods: In 2023, this study examined data from the 2019–2020 Longitudinal National Health Interview Survey. A Generalized Linear Latent and Mixed Model (GLLAMM) was used to analyze the longitudinal data.

Results: The descriptive analysis of population averages showed that fewer workers with AtPSL reported daily feelings of depression (45%), anxiety (24%), and both depression and anxiety (52%) than workers without AtPSL. According to the GLLAMM analysis, the odds of workers with AtPSL self-reporting feelings of daily depression, anxiety, and both were 48%, 27%, and 51% lower, respectively, than workers without AtPSL. This analysis controlled for different demographic and socio-economic variables. Robustness analysis demonstrated that these associations persisted when the outcome variables were measured in terms of self-reported feelings of weekly depression and anxiety.

Conclusions: The role of mental health in improving overall well-being and the recognition of AtPSL as a social justice issue have reinforced the importance of providing paid sick leave to help protect the mental health status of workers. This study, using a unique longitudinal data set, found that AtPSL was associated with a lower prevalence of self-reported daily or weekly feelings of depression and anxiety.

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INTRODUCTION

Paid sick leave is a nonwage benefit employers may offer. In the U.S., the average cost to employers of providing access to paid sick leave (AtPSL) for private industry workers was \$0.50 per hour in 2023.¹ The U.S. is one of few countries worldwide and the only Organization for Economic Cooperation and Development country that does not have a national paid sick leave policy.² AtPSL has several benefits for workers and their family members, as well as for employers and society. Having AtPSL increased usage of preventive and outpatient health services by workers and their family members and reduced the incidence of delayed care and emergency room visits.^{3–7} Improved sleep quality, lower

levels of psychological distress, improved overall health status, better financial well-being, and higher retirement savings have all been associated with AtPSL.^{8–10} In addition, AtPSL has several potential benefits for employers and society; these benefits include reductions in the spread of contagious illness, presenteeism, all-cause and

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specific mortality, workplace injury, overall leave taking, and job instability.^{11–17} Based on these and other findings, the American Public Health Association considers paid sick leave as a public health policy issue.¹⁸

AtPSL could influence the mental health status of workers in at least 3 ways. First, based on a unified stress model, not having access to workplace benefits such as AtPSL could affect workers' appraisal of their situation in the case of their own or family members' illness; this, in turn, could lead to psychological distress.⁹ For instance, workers with AtPSL know that they could take time off without losing income or their job if they or their family members were sick. Protected income, job security, and the self-esteem associated with helping oneself or family members may lead to improved mental health outcomes.¹⁹ On the other hand, workers without AtPSL might be pressured to work when they or their family members are sick, and consequently might not be able to give necessary help without risking their income or job. Over time, such stressors could lead to negative mental health outcomes such as feeling worthless, having low confidence, feeling helpless, having anxiety, and being depressed.⁹

Second, AtPSL could affect the mental health status of workers by improving their sleep quality. Collins et al.⁸ showed that U.S. adult workers with AtPSL had higher odds of staying asleep and having little trouble falling asleep than workers without AtPSL. A meta-analysis of studies also showed that sleep and sleep quality were potential contributing factors for most mental disorders such as depression and anxiety.²⁰

Third, financial stress is strongly associated with a higher likelihood of mental health problems such as depression and anxiety,^{21–23} and several studies documented an association between AtPSL and financial well-being.^{10,24} A worker without AtPSL will lose income or in the worst case their job if they or their family members are sick and the worker is absent from work. This will lead to or aggravate financial stress.²⁴ DeRigne et al.¹⁰ showed that workers without AtPSL were more likely to worry about medical bills from unforeseen illness or injury, maintenance of standard of living, and other expenses such as credit card payments.

Very few studies have studied the role of having AtPSL in improving the mental health of workers. The literature review showed that, thus far, only Stoddard-Dare et al.⁹ addressed the issue of AtPSL and psychological distress in the U.S. The study, using 2015 cross-sectional NHIS data, examined the association between AtPSL and the mental health status of U.S. workers as measured by the 6-item Kessler Psychological Distress Scale (K6). However, as in other studies in this area,^{3,4,11,25} this study was based on cross-sectional data.

Unless a randomized control or a quasi-experimental research design was used (see, for instance, Slopen²⁶), results from cross-sectional data could suffer from omitted-variable bias if the omitted variables were correlated with one or more explanatory variables in the model and if the omitted variables were correlated with the outcome variable.²⁷ For instance, in the Stoddard-Dare et al. study,⁹ occupation was not included as a control variable. Studies have shown that occupation is one of the risk factors for mental health problems,^{28,29} and it is also highly correlated with AtPSL.³⁰ This implies that results from this study could suffer from omitted variable bias. Moreover, jobs with AtPSL may offer a set of other benefits that may be related to lower depression and anxiety. In a cross-sectional study, these unobservable factors may lead to an omitted-variable bias.

The present study sought to address some of these gaps by investigating the association between AtPSL and self-reported feelings of daily or weekly depression and anxiety using a unique longitudinal data set on a nationally representative U.S. working population.

METHODS

Study Sample

The data source for this study was the 2019–2020 sample adult longitudinal component of the National Health Interview Survey (NHIS) data by the National Center for Health Statistics (NCHS). The NHIS data are publicly available, and IRB approval was not required.

In 2020, the NCHS reinterviewed 10,415 nationally representative adults who had completed the 2019 interview. Respondents who did not work during the survey week in both 2019 and 2020 (~43%), and who performed unpaid work at family businesses or were self-employed (6%) were excluded from the study. Workers with missing values on the outcome variables, independent variable, and covariates presented below in any of the two years were also excluded (3.4%). Finally, 5,500 workers and 9,791 observations were considered in the study. See [Appendix Table 1](#) for the details.

Measures

The outcome variable, the mental health status of workers, was measured in terms of self-reported feelings of daily depression and anxiety, the 2 most commonly used indicators to measure mental health conditions.³¹ Three binary (0 or 1) indicators were created: self-reported feelings of daily depression (daily depression, hereafter), self-reported feelings of daily anxiety (daily anxiety, hereafter), and both (daily depression and anxiety, hereafter). First, the question “How often do you feel depressed? Would you say daily, weekly, monthly, a few

times a year, or never?” measured depression. Workers who reported they felt depressed daily were considered as daily depressed. Second, the question “How often do you feel worried, nervous, or anxious? Would you say daily, weekly, monthly, a few times a year, or never?” measured anxiety. Workers who reported they felt worried, nervous, or anxious daily were considered as daily anxious. Third, the two responses were combined to identify workers who reported daily feelings of both anxiety and depression. Some researchers have used “weekly” instead of daily to measure depression and anxiety symptoms.³² To check the robustness of the study findings, this study also measured weekly self-reported feelings of depression (weekly depression, hereafter) and weekly self-reported feelings of anxiety (weekly anxiety, hereafter).

The independent variable, AtPSL, was measured using the question “Regarding your job or work last week, is paid sick leave available if you need it?” One was given for workers who said “yes” and zero for those who said “no.” To control for the effects of demographic, socioeconomic, and lifestyle variables on the outcome variables, the study employed the following covariates: sex, age category; race and ethnicity; one or more children in the family; marital status; college education; health insurance; smoking status; obesity; family poverty status; and region. See [Table 1](#) for the details.

Statistical Analysis

The unit of analysis was an individual worker at time t ($t=2019, 2020$). The analysis used descriptive statistics (without considering the longitudinal nature of the data) to compare population average depression, anxiety, and both by AtPSL. In this case, the analysis used individual 2019 and 2020 weights provided by the NCHS. In the multivariable analysis, this study used a Generalized Linear Latent and Mixed Model (GLLAMM) to exploit the longitudinal nature of the data. The GLLAMM analysis incorporated both random and fixed effects specifications, made allowance for unobserved heterogeneity by introducing latent individual effects,³³ allowed unbalanced longitudinal data to be modeled where individuals were measured at different sets of time points, and permitted frequency and probability weighting.³⁴

The GLLAMM analysis allows a wide range of responses including dichotomous, ordinal, and nominal types and includes random effects to take into account unobserved individual-level covariates.³³ This study specified a GLLAMM with a logit link and binomial family to match the binary outcome variables (yes/no). The analysis used a community-contributed command for multilevel and latent variable modeling, called *gllamm* software³⁴ with 12-point adaptive quadrature, to

estimate the model. See Rabe-Hesketh et al.³⁴ for the theoretical background, mathematical presentation, and estimation strategy of the GLLAMM. The longitudinal weight provided by the NCHS was used in the multivariable analyses.

RESULTS

The analysis sample consisted of 5,500 workers (9,791 obs.). This sample represented 129.6 million adult individuals who worked in 2019 or 2020. Overall, 69.8% of workers had AtPSL during the study period.

[Table 1](#) presents the population average descriptive statistics of the variables used in the study by year. Except in terms of sex, one or more children in the family, and obesity, workers without and with AtPSL had some statistically significant differences in both years. Hispanics and widowed/divorced/separated workers were less likely to have AtPSL than their comparison groups. The percentage of workers younger than 30 years and older than 64 years with AtPSL was also relatively low compared with other age groups. As expected, college educated workers, workers with family incomes 200% and above the Federal Poverty Level, and workers with health insurance were more likely to have AtPSL.

[Table 2](#) presents the percentage of workers who reported daily or weekly depression, anxiety, and both in 2019 and 2020, separately for workers with and without AtPSL. In all cases, the percentage of workers without AtPSL who reported daily or weekly depression, anxiety, and both was higher than workers with AtPSL though the differences were not statistically significant at $p<0.05$ level for daily depression and daily depression and anxiety in 2020 and weekly anxiety in both years.

During the study period, 18% of workers reported changes in their AtPSL. Nearly 6.3% of workers lost their AtPSL, while 11.7% of workers gained AtPSL. To take advantage of the longitudinal nature of the data, a GLLAMM model was estimated, and [Table 3](#) reports the estimated odds ratio and the 95% CIs for the 3 outcome variables. Controlling for observed and unobserved characteristics, AtPSL was associated with a 56% decrease in the odds of reporting daily depression during the study period. AtPSL was also associated with a 31% decrease in the odds of reporting daily anxiety. Finally, AtPSL was associated with a 64% decrease in the odds of reporting daily depression and anxiety.

Although coefficients of the control variables for all outcomes were not reported, it is worth noting that some of the estimates are in line with expectations and prior research. [Appendix Table 2](#) presents the results for depression and anxiety variables. The results were

Table 1. Population Average Workers' Characteristics by Access to Paid Sick Leave (AtPSL)—Longitudinal NHIS Data (2019–2020)^a

Variables [1]	Total (2019 & 2020) (column %) (n=9,791) ^b [2]	2019 (n=5,251)			2020 (n=4,540)		
		AtPSL (row %)			AtPSL (row %)		
		No [3]	Yes [4]	Chi-square test [5]	No [6]	Yes [7]	Chi-square test [8]
No. of obs.							
Sex				5.1			0.6
Male	52.7	30.5	69.5		27.3	72.7	
Female	47.3	33.4	66.6		28.3	71.7	
Age category, years				197.9***			146.0***
18–29	23.3	38.5	61.5		37.7	62.3	
30–44	32.6	24.2	75.8		21.8	78.2	
45–64	37.0	29.4	70.6		23.2	76.8	
65 and above	7.1	57.7	42.3		46.0	54.0	
Race and ethnicity				52.1***			51.8***
Hispanic	16.5	42.3	57.7		37.5	62.5	
Non-Hispanic White	65.1	30.0	70.0		25.7	74.3	
Non-Hispanic Black	9.6	32.9	67.1		29.0	71.1	
Non-Hispanic Asian	6.1	25.6	74.4		20.9	79.1	
Other ^c	2.7	30.5	69.5		23.7	76.3	
One or more children in the family				1.0			2.1
No	60.6	32.4	67.6		27.0	73.0	
Yes	39.4	31.1	68.9		29.0	71.0	
Marital status				24.9***			40.3***
Married	64.5	29.6	70.4		24.6	75.4	
Widowed, divorced, separated	12.1	35.3	64.7		31.8	68.2	
Never married	23.3	36.8	63.2		34.0	66.0	
College degree							209.2***
No	48.0	43.2	56.8	254.6***	37.1	62.9	
Yes		52.0	22.6	77.5	17.9	82.1	
Health insurance							215.1***
No	7.9	63.9	36.1	193.4***	59.5	40.5	
Yes	92.1	29.4	70.6		24.8	75.2	
Workers who:				17.6***			13.8*
Smoke	13.1	39.1	60.9		34.3	65.7	
Used to smoke	19.1	31.9	68.1		26.8	73.2	
Never smoke	67.8	30.7	69.3		26.9	73.1	
Obesity (BMI≥30)				0.6			0.7
No	65.5	32.3	67.7		27.4	72.6	
Yes	34.5	31.2	68.8		28.5	71.5	
Family poverty status				348.8***			313.3***
Incomes below the FPL	5.9	69.5	30.5		59.8	40.2	
Incomes between 100% and 199% of FPL	13.1	50.8	49.2		46.0	54.0	
Incomes 200% and above of the FPL	81.1	26.6	73.4		22.0	78.0	
Census region (%)				54.7***			47.7***
Northeast	17.3	27.0	73.0		21.8	78.2	
Midwest	24.0	33.9	66.1		29.7	70.3	
South	34.4	37.3	62.7		32.7	67.3	
West	24.4	26.3	73.7		22.9	77.1	

Note: Boldface indicates statistical significance ($p < 0.05$; * $p < 0.05$; ** $p < 0.005$).

^aThe second column shows the results for the total sample. The third and fourth columns show results for workers without and with AtPSL in year 2019 and the sixth and seventh columns for year 2020. The fifth and eighth columns show if the differences between workers without and with AtPSL were statistically significant using a chi-square test for years 2019 and 2020, respectively.

^bNote that 960 workers who worked in 2019 but not in 2020, as well as 249 workers who worked in 2020 but not in 2019, had only 1-year observations.

^cThe "other" racial category includes non-Hispanic American Indians and Alaska Natives, other ethnic groups, and single and multiple races.

FPL, Federal Poverty Level.

Table 2. Population Average^a Self-Reported Feelings of Daily or Weekly Depression, Anxiety, and Both by Access to Paid Sick Leave (AtPSL)

Outcome variables	Total (n=9,791) (%)	2019 (n=5,251)			2020 (n=4,540)		
		AtPSL (%)			AtPSL (%)		
		No	Yes	Chi-square test	No	Yes	Chi-square test
Reporting feelings of daily:							
Depression	2.3	3.8	1.7	22.8***	2.6	1.9	2.1
Anxiety	10.4	13.0	9.4	15.8***	12.2	9.4	8.0*
Depression and anxiety	1.6	2.9	1.0	26.6***	2.0	1.4	2.6
Reporting feelings of weekly:							
Depression	7.4	9.6	5.6	28.6***	10.7	6.8	18.9***
Anxiety	26.1	27.1	24.1	5.4	29.7	26.6	4.4
Depression and anxiety	6.3	8.9	4.6	37.1***	9.4	5.9	17.6***

Note: Boldface indicates statistical significance ($p < 0.05$; * $p < 0.05$, *** $p < 0.005$).

^aThis study used the 2019 and 2020 weights.

similar to those of the other outcome variables. All results are available upon request.

The study explored the robustness of its findings in two ways. First, in the 2019/2020 NHIS longitudinal data set, 9.8% of workers who worked in 2019 did not work in 2020, and 2.5% of workers who did not work in 2019 worked in 2020. This pattern varied by AtPSL. For instance, 27.7% of workers without AtPSL in 2019 did not work in 2020, compared to 13.1% of workers with AtPSL in 2019 who did not work in 2020. This might underestimate the impact of AtPSL on reporting depression and anxiety because workers without AtPSL are

more likely to leave the labor market in the case of health shocks.³⁵ Consistent with this hypothesis, the associations between AtPSL and depression and anxiety were slightly lower when workers who worked in 2019 but did not work in 2020 or vice versa were excluded in the analysis. As shown in Table 3, the odds of workers with AtPSL to report daily depression, anxiety, and both were 48%, 27%, and 40% lower than workers without AtPSL, respectively.

Second, depression and anxiety were measured on a weekly basis (as opposed to a daily basis). The results presented in the last four rows of Table 3 show that the

Table 3. Association Between Access to Paid Sick Leave (AtPSL) and Self-Reported Feelings of Depression, Anxiety, and Both: GLLAMM Results

Outcome variables	Adjusted odds ratio (95% CI) ^a	No. of respondents	No. of observations
Self-reported feelings of daily			
Depression	0.44*** (0.26–0.74)	5,500	9,791
Anxiety	0.69*** (0.54–0.88)	5,500	9,791
Depression and anxiety	0.45** (0.24–0.81)	5,500	9,791
Robustness check			
1. Excluding respondents who did not work in both 2019 and 2020 ^b			
Self-reported feelings of daily			
Depression	0.52* (0.28–0.96)	4,291	8,582
Anxiety	0.73* (0.53–0.99)	4,291	8,582
Depression and anxiety	0.60 (0.28–1.29)	4,291	8,582
2. Self-reported feelings of weekly			
Depression	0.41*** (0.26–0.64)	5,500	9,791
Anxiety	0.66*** (0.50–0.86)	5,500	9,791
Depression and anxiety	0.35*** (0.23–0.54)	5,500	9,791

Note: Boldface indicates statistical significance ($p < 0.05$; * $p < 0.05$, ** $p < 0.01$, *** $p < 0.005$).

^aControlling for sex, age category, one or more child in the family, marital status, college education, health insurance, smoking status, obesity (BMI ≥ 30), family poverty status, and census region.

^bNote that 960 respondents worked in 2019 but not in 2020, and 249 respondents worked in 2020 but not in 2019.

odds of workers with AtPSL to report weekly depression, anxiety, and both were 59%, 34%, and 65% lower than workers without AtPSL, respectively.

DISCUSSION

Previous research has reported positive associations among AtPSL and several health and well-being outcomes. Only one study so far has examined the association between AtPSL and mental health issues in the U.S. using the 2015 NHIS cross-sectional data.⁹ But the results from this study may have been confounded by omitted covariates as indicated in the Introduction to this paper. The COVID-19 pandemic has also increased the importance and urgency of providing paid sick leave and protecting the mental health status of the working population. This paper contributes to filling these research gaps and addressing this critical aspect of worker health by examining the association between AtPSL and self-reported feelings of depression and anxiety, the 2 most important contributors to the burden of mental disorders.³⁵ The GLLAMM and the unique 2019–2020 longitudinal data controlled for unobserved heterogeneity, include within-worker differences.

The GLLAMM regression results showed that, controlling for unobservable variables and between-worker variation, AtPSL had a statistically significant association with reduced depression and anxiety among workers, adding evidence to the growing literature that demonstrates the public health benefits of expanding AtPSL. The odds of workers with AtPSL reporting daily depression, anxiety, and both were 48%, 27%, and 51% lower, respectively, than for workers without AtPSL. The results were similar but stronger when depression and anxiety were measured on a weekly basis. Using the 2015 cross-sectional NHIS data, Stoddard-Dare et al.⁹ showed that, controlling for sociodemographic factors, workers without AtPSL had a statistically significant higher Kessler Psychological Distress Scale score (K6) and were 45% more likely to report that their distress symptoms interfered with their life or activities than workers with AtPSL.

The socioeconomic costs of mental health problems are enormous. Worldwide, the burden of the 2 most common mental health problems—depression and anxiety—in terms of medical costs and reduced productivity was estimated to be \$2.5 trillion per year in 2010. These costs are expected to increase to \$6 trillion by 2030.³⁶ In the U.S., the economic burden of major depressive disorder among U.S. adults in terms of productivity loss and medical costs increased from \$236.6 billion in 2010 to \$326.2 billion in 2018 (in 2020 values).³⁷ During the

COVID-19 pandemic, the percentage of U.S. adults reporting symptoms of anxiety and depression increased from 35.9% in April 2020 to 39.3% in February 2021.³⁸

Based upon these sizable economic costs, increasing predicted trends of mental health problems, and the role of AtPSL in reducing depression and anxiety, expanding AtPSL has important implications for reducing the societal economic burden of depression and anxiety. However, the benefits of AtPSL might vary across different occupations and industries for several reasons. Occupation and industry are some of the risk factors for depression and anxiety.²⁹ The percentage of workers with AtPSL also varies by occupation and industry. As a result, the association between AtPSL and depression and anxiety may not be the same across different occupations and industries. Future studies might explore the potential benefit of expanding AtPSL on reducing depression and anxiety by occupation or industry.

Limitations

The study has some limitations. First, moving from one job without AtPSL to another job with AtPSL could be a decision variable if workers consider AtPSL as a major factor in their job change decisions. This might introduce endogeneity bias. However, this bias would be very small because only 3.1% of workers changed jobs in 2019 and 3.9% of workers changed jobs in 2020. Second, the longitudinal NHIS data does not employ the 2-item Patient Health Questionnaire (PHQ-2) or the 2-item Generalized Anxiety Disorder scale (GAD-2), which are standard scales commonly used to measure depression and anxiety in population-based samples. As a result, this study might not be directly comparable with other studies that used PHQ-2, GAD-2, or the Kessler Psychological Scale. Third, even though recall bias and reporting errors might not pose serious problems in longitudinal data, both the depression and anxiety variables were self-reported. Fourth, the independent variable, AtPSL, was measured as a dichotomous variable. This might camouflage differences in the number of paid sick days available to workers with AtPSL. A recent study showed that the number of paid sick days affected the use of preventive services.³⁹ At the same time, AtPSL does not mean use. Employers also limit the amount of paid sick time that employees can earn or use in a year. This factor might affect the use of paid sick leave when it is needed, resulting in underestimation of the true impact of use of paid sick leave in reducing reported depression and anxiety. Large surveys on AtPSL might be more helpful if they included questions about the number of paid sick days respondents are entitled to and the number they used each year.

CONCLUSIONS

Paid sick leave is increasingly identified as a social justice issue having important implications for health and wellness. However, little is known about the relationship between access to paid sick leave (AtPSL) and mental health, one of the major causes of disability, morbidity, and cost in developed countries, and no study so far had examined this relationship using longitudinal data in the U.S. This study investigated the AtPSL–mental health problems nexus using a unique longitudinal NHIS data set. The research revealed a statistically significant association between AtPSL and lower likelihood of self-reporting daily or weekly feelings of depression, anxiety, and both, controlling for observed and unobserved time invariant differences between workers with and without AtPSL. Increasing AtPSL might reduce self-reported feelings of depression and anxiety among the U.S. working population. This study adds to the growing body of research on the societal benefits of expanding AtPSL.

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SUPPLEMENTAL MATERIAL

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