

Discrimination in the Workplace Linked to Psychological Distress: A Longitudinal Study in the United States

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Author Contribution

Conceptualization, J.L.; methodology, J.L.; software, J.L.; validation, J.L.; formal analysis, M.G. and J.L.; investigation, J.L.; resources, J.L.; data curation, J.L.; writing—original draft preparation, E.K.; writing—review and editing, E.K., M.G. and J.L.; visualization, M.G.; supervision, J.L.; project administration, J.L.; funding acquisition, J.L. All authors have read and agreed to the published version of the manuscript.

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Conflicts of Interest

None declared.

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Data Availability Statement

The raw data of the Midlife in the United States (MIDUS) Study are publicly available from: <https://www.icpsr.umich.edu/web/NACDA/series/203> (accessed on 19 March 2020). The statistical SAS syntax supporting the conclusions of this article will be made available by the authors, without undue reservation. Requests to access the statistical SAS syntax should be directed to Dr. Jian Li (jianli2019@ucla.edu).

Ethical Considerations and Disclosures

This study was reviewed and approved for exemption by the University of California, Los Angeles Institutional Review Board (IRB#20-001044), and followed the Declaration of Helsinki guidelines, as well as the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) reporting guidelines (see Supplementary Materials B, Table 1).

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Abstract

Objective

To explore the relationship between workplace discrimination and psychological distress across nine years using data from the Midlife in the United States (MIDUS) study.

Methods

Workplace discrimination was measured with a validated 6-item scale at baseline with three categories (low, intermediate, and high), and psychological distress was measured with the Kessler-6 scale at baseline and follow-up. In total, 1,546 workers were analyzed by linear regression.

Results

High levels of workplace discrimination were significantly associated with increased psychological distress at follow-up (crude $\beta = 0.633$, 95% CI = 0.307, 0.959). After adjusting for demographic factors, socioeconomic status, and health-related behaviors, associations were slightly attenuated (fully adjusted $\beta = 0.447$, 95% CI = 0.115, 0.780).

Conclusions

High workplace discrimination was longitudinally associated with higher levels of psychological distress. Organizations should actively prevent discrimination which may improve workers' mental health consequently.

Keywords

Workplace discrimination, psychological distress, longitudinal study, occupational health, psychosocial factors

Bulleled Learning Outcomes

- Organizations will be able to plan for structural changes that will reduce workplace discrimination.
- Clinicians will be able to identify how workplace discrimination may lead to psychosocial distress and understand the importance of screening for symptoms to offer appropriate individual strategies for mitigating consequences.
- Researchers will be able to outline areas to target in future studies to determine best practice interventions that may reduce workplace discrimination.

ACCEPTED

Workplace discrimination remains a prevalent issue in the American occupational landscape,^{1,2} despite United States (U.S.) laws.³ Workplace discrimination can be considered as the bias or prejudice against a worker or group of workers, based on their individual characteristics, such as gender, race, sexual orientation, age, religion, socioeconomic status, or disabilities.⁴⁻⁶ Workplace discrimination may be evident during the recruitment and hiring process,⁷ as well as within a worker's interpersonal relationships through microaggressions and incivility (i.e., being avoided, left out, bullied, insulted).⁸ Discrimination on the basis of race and sex remain particularly prevalent as an estimated 25% of Black workers and 11% of women workers in the U.S. have reported at least one form of workplace discrimination.⁹ With continued growth in a more experienced workforce,¹⁰ age discrimination also remains a prevalent issue.¹¹ In one study using data from the Midlife in the United States (MIDUS) study, 81% of U.S. workers aged 50 years and older experienced an area of workplace discrimination.¹² An another report sampled workers 45 years of age or older and found that 61% experienced or witnessed discrimination in the workplace based on age.¹³ Examples of age discrimination include if only certain ages or years of experience are sought during the hiring and recruitment process, if an employee is passed up for a promotion because of their age, or if the organizational culture maintains ageist assumptions about ability and peers share negative comments related to someone's age.^{11,13} One scoping review of 43 studies further explored the effects of ageism on work experience and implications for workers over 50 years old, revealing themes including 1) stereotypes and perceptions of older workers, 2) intended behavior toward older workers, 3) reported behavior toward older workers, 4) and older workers' negotiation of ageism.¹⁴ Another scoping review called for different approaches and methods to continue research that will counteract ageism in the workplace.¹⁵ Of the 39 discursive papers on ageism and working life

included in this review, the population ranged greatly from 40 to 80 years old, which highlights the opportunity to narrow focus on those around mid-life in future research.¹⁵

Unspecified discrimination has been well documented as a major stressor,¹⁶ with consequences including the negative influence on mental and physical health.¹⁷⁻¹⁹ For example, discrimination broadly has been associated with depression, anxiety, loneliness, lower well-being, reduced life-satisfaction,^{17,20} increased likelihood for smoking,²¹ hypertension,^{22,23} and psychological distress.^{24,25} Psychological distress can be understood as the maladaptive emotional or physical response to a stressful situation encountered, causing a person discomfort and harm.^{2,26} Psychological distress is often considered as an early and sensitive indicator of one's mental health, and has been associated with symptoms of anxiety and depression.²⁷ It has also been linked to poor physical health outcomes,²⁸ including an increased risk for cardiovascular disease²⁹ - the leading cause of death globally.³⁰

In recent years, *workplace* discrimination has received more attention with studies supporting a relationship between workplace discrimination and mental health. Specifically, one case study revealed that workplace discrimination is positively associated with increased stress among Nepalese immigrant workers in the United Kingdom.³¹ Another study showed the inverse relationship between mental health status and self-perceived workplace discrimination among immigrant workers in Italy.³² A literature review suggested a relationship between workplace discrimination experiences and mental health impacts among sexual and gender minorities.³³ Additional evidence has supported that the experience of workplace discrimination was

significantly associated with probable anxiety and depression among healthcare staff working in London.³⁴ While these prior studies had cross-sectional research designs and lacked temporal relationships, Marchiondo et al³⁵ found that workplace discrimination predicted elevated depressive symptoms over a 4-year period among older workers (>50 years) in the U.S. Because of the seniority of the study participants, only age discrimination at work was examined. Similarly, in a longitudinal study focusing on age discrimination among women from 1967 to 2003, results supported the relationship between work-related perceived age discrimination on women's mental health, where greater discrimination led to greater depressive symptoms.³⁶ According to Clausen et al,²⁰ workplace discrimination was also a risk factor for the onset of depressive disorders among Danish general workforce, with a 6-month follow-up period. Additionally, Han et al³⁷ analyzed the Youth Development Survey from early adulthood to midlife with a long follow-up from 1988 to 2019, and found evidence of the impacts of race/ethnicity and gender related discrimination in the workplace on a depressed mood.

Both workplace discrimination and elements that comprise mental health, such as psychological distress, have costly consequences. High levels of psychological distress have been predictive of increased absenteeism from work,³⁸ affecting organizations and contributing to higher health service expenditures and utilization, impacting healthcare systems as a whole.³⁹ Workplace discrimination contributes to higher organizational costs related to turnover, long-term sickness absence, and discrimination claims - as an estimated \$513 million was owed to workers in 2022.⁴⁰⁻⁴³ The consequences of workplace discrimination further extend onto the individuals, including unfair employment experience.⁴⁴

Despite the literature including some longitudinal studies on workplace discrimination and mental health^{20,35,30,31} there is limited focus on workplace discrimination and *psychological distress*, with only one cross-sectional study focusing on these concepts specifically.⁴⁵ Instead, psychological distress has been explored with similar concepts not explicitly defined as ‘workplace discrimination’ (i.e., ‘workplace bullying’ or ‘workplace harassment’),⁴⁶⁻⁴⁸ or workplace discrimination has been explored with a focus on depressive symptoms as a mental health outcome. Thus, there is the opportunity to explore the long-term relationship between workplace discrimination and psychological distress among U.S. workers. By identifying psychological distress early and directly (instead of measuring the status of mental health or depressive symptoms), moderate to serious mental health impairment may be avoided, and clinicians may be able to provide more appropriate, targeted treatment.^{49,50}

Work is considered a social determinant of health, where the workplace environment (including the physical structure and social organization) directly impacts workers’ health.^{51,52} The Occupational Safety and Health Act of 1970 requires that workers be provided with a work environment free from harm, limiting both psychological and physical risks.⁵³ To mitigate potential harm caused by workplace discrimination and psychological distress, there first needs to be a better understanding of this relationship. The purpose of this study was to fill in the research gaps and provide longitudinal evidence on how workplace discrimination relates to psychological distress levels in a sample of U.S. workers over nine years. Results may inform how to better promote the workability and well-being of workers by reducing their psychological distress.

METHODS

Primary Study

This study was based on publicly accessible data from the MIDUS study.⁵⁴ The MIDUS study is an ongoing national population-based longitudinal study aiming to evaluate the roles of biomedical, psychological, and social factors in explaining people's mental and physical health. So far, rich data have been gathered over three different time points starting in 1995 (MIDUS I), then in 2004-2005 (MIDUS II), and 2013-2014 (MIDUS III).

Sample

We used MIDUS data derived from the II wave (baseline of current study) and III wave (follow-up of current study), focusing on participants who completed survey information on the variables of interest (i.e., workplace discrimination and psychological distress). Inclusion criteria involved participants in the MIDUS II group that were currently employed (i.e., working for pay), with full data on workplace discrimination, covariates, psychological distress, and follow-up in MIDUS III. Participants were excluded if they were not currently working ($n = 2,650$), had missing data of interest ($n = 142$) in MIDUS II, were lost to follow-up ($n = 460$, resulting in 78.81% follow-up rate), or had missing data in MIDUS III. The final sample for analyses was 1,546 (see Figure 1).

Measures

Workplace discrimination was determined with six validated questions using a 5-point Likert-type scale^{12,23} in MIDUS II. These questions were added together yielding a sum with a range between 5-30, and categorized into three groups: low, intermediate, and high. The specific

questions can be found in Supplementary Materials A (<http://links.lww.com/JOM/B635>), Table 1. In this sample, the workplace discrimination scale had an acceptable Cronbach's alpha ($\alpha = 0.72$).

The Kessler 6 (K6) scale evaluated nonspecific psychological distress⁵⁵ in both MIDUS II and III. This is a six-item validated scale,⁵⁶ in which questions are added up for a score ranging from 0-24. This measure has been used among workers previously.^{57,58} Among the sample of the present study, the Cronbach's alphas were acceptable both at MIDUS II ($\alpha = 0.82$) and MIDUS III ($\alpha = 0.83$). Covariates included demographic variables of age, sex, race, marital status, educational attainment, annual household income, current smoking status, alcohol consumption, and physical exercise in MIDUS II.

Statistical Analyses

Using SAS 9.4 statistical software, descriptive statistics were run on the included participants. Longitudinal associations of workplace discrimination at baseline with psychological distress at follow-up were examined using general linear regression modeling to produce β coefficients and 95% confidence intervals (CIs). Analyses generated the following models: due to high correlation of outcome variable at baseline and follow-up, the crude model adjusted for psychological distress at baseline in order to take ceiling / floor effect into account; Model I adjusted for demographic characteristics including age, sex, marital status, and race; Model II additionally adjusted for socioeconomic indicators of educational attainment and annual household income; and Model III additionally adjusted for health-related behaviors of

smoking, alcohol consumption, and physical exercise. Moreover, we performed sensitivity analysis with the continuous measure of workplace discrimination.

RESULTS

At baseline, the 1,546 participants were mainly White ($n = 1,441$, 93.21%), aged 46-55 years old ($n = 595$, 38.49%), married ($n=1,145$, 74.06%), and with a university degree or more ($n = 756$, 48.90%). Overall, the sample demonstrated relatively good health-related behaviors, as most participants reported not smoking ($n = 1,351$, 87.39%), high physical exercise ($n = 811$, 52.46%), and no or light alcohol consumption ($n = 910$, 58.86%). See Table 1 for Sample Characteristics.

The average workplace discrimination levels varied slightly across groups at baseline and at follow-up. For instance, those who reported high workplace discrimination also reported the highest levels of psychological distress at baseline ($M = 3.43$) and at follow-up ($M = 3.28$) compared to the lower exposure groups of workplace discrimination. See Table 2 for mean values of psychological distress at baseline and follow-up across workplace discrimination categories (i.e., low, intermediate, high). The correlation coefficient for K6 at baseline and at follow-up was 0.54, $p < 0.0001$.

The linear regression modeling in Table 3 revealed significantly positive associations between workplace discrimination at baseline and changes in psychological distress. Specifically, when compared to the low level of workplace discrimination, high levels of workplace discrimination at baseline were significantly associated with increased psychological

distress at follow-up (crude $\beta = 0.633$, 95% CI [0.307, 0.959], $p = 0.0001$). The associations were slightly attenuated after adjusting for demographic factors, socioeconomic status, and health-related behaviors (fully adjusted $\beta = 0.447$, 95% CI [0.115, 0.780], $p = 0.0084$).

Sensitivity analyses suggest that with every one unit increase in workplace discrimination at baseline, psychological distress at follow-up was significantly increased by 0.086 units (95% CI [0.055, 0.117], $p < 0.0001$). The associations were slightly attenuated after adjusting for demographic factors, socioeconomic status, and health-related behaviors (fully adjusted $\beta = 0.068$, 95% CI [0.036, 0.100], $p < 0.0001$) (see Supplementary Materials A, <http://links.lww.com/JOM/B635>, Table 2).

DISCUSSION

This study expands understanding of workplace discrimination and mental health among the midlife population, who experience unique roles and life transitions. Certain challenges among this population involve navigating and balancing various social roles,⁵⁹ potentially leading to lower satisfaction in life. In particular, evidence found in one study that examined cross-sectional data from 500,000 Americans and Europeans, revealed a U-shape of wellbeing in age, with lower levels of happiness and life satisfaction among those throughout their 40s.⁶⁰ Other researchers explored data from 340,847 Americans who responded to a telephone survey, and found a general U-shape of wellbeing, where levels dipped and then increased again after 50 years old.⁶¹ Worry in this same study was further elevated throughout mid age and then decreased.⁶¹

Mid-life individuals remain an essential group in the workplace, acting as a vast resource for organizations, and offering important experience to their roles, which may help to improve engagement and productivity in the workplace.^{11,13} In alignment with results from the present study, researchers previously examined cross-sectional data of U.S. adults aged between 40 and 70 years old, measured across five waves from the General Social Survey (2002–2018) study, and found that discrimination based on age increased job-related stress and poor mental health.⁶² In another study, nine out of ten workers agreed that stronger laws may be considered to ensure workers are protected from age discrimination.¹³ Thus, organizations may consider reducing discrimination related to age by recognizing and rejecting certain ageist stereotypes.¹³

Findings from this work revealed that workplace discrimination at baseline was longitudinally related to psychological distress over nine years. Such findings reinforce previous evidence suggesting the cross-sectional significant relationship between perceived discrimination and psychological distress among a group of migrant workers in Malaysia.⁴⁵ Long term impacts of workplace discrimination have also been found on depressed mood, changing from early adulthood to midlife, with greater impacts found among those in their mid-30s.³⁷ A literature review on gender discrimination in the workplace further supports associations of workplace discrimination with mental health, including stress, anxiety and depression.⁶³ Future research efforts should focus on sampling diverse working groups over time and providing additional context to the worker experience of discrimination and psychological distress.

Occupational health clinicians may consider results of this work and employ screening for psychological distress during general mental health screenings, especially among their mid-

life patients. Clinicians can integrate an understanding that workplace discrimination may be a related factor to psychological distress generally, along with other contributors that include loneliness, work-family conflict, and job dissatisfaction.⁶⁴ In assisting individuals to identify workplace discrimination as a stressor, clinicians can promote protective factors and offer recommendations for what workers can do at the personal level to alleviate any psychological distress.⁵⁰ For example, individuals can incorporate mindfulness practices and foster positive supportive relationships with family, friends, and coworkers.^{17,64} Previous findings have enforced a buffering effect of social support on the relationship between general discrimination and psychological distress among African American adults,⁶⁵ and a buffering effect of co-worker support on workplace bullying and psychological distress.⁴⁶ Reducing psychological distress is essential in improving the workability of workers by not only reducing sickness absenteeism and increasing productivity,⁶⁶ but also reducing health disparities and improving their overall physical health.^{67,68}

Despite personal interventions to manage workplace discrimination, efforts should largely be focused at the organizational level. Previous evidence has similarly called for organizational structural changes to reduce workplace discrimination.⁶⁹ Employers may consider: using tools to measure discrimination periodically to check in with workers and have a baseline to measure changes with; providing strong support for worker advocacy groups with management buy-in; offering educational opportunities (i.e., awareness training, skill building, cultural diversity training); making sure the recruitment and hiring processes promote diversity; and ensuring effective enforcement of anti-discrimination laws with a commitment to addressing these issues- or making formal policies changes if none exist.^{70,71,72,73} Organizations can maintain

transparency of their strong commitment for diversity with a clear organizational message for inclusivity and a cohesive workplace climate, as this has been found to mitigate harm caused by discrimination.^{73,74} To implement and embrace such changes, organizations may further share an adaptive organizational learning perspective, underscoring how learning new things (i.e., attending educational opportunities) may lead to positive behavior changes and an overall improved workplace culture.⁷⁵ Future research should continue to uncover systematic approaches and evidenced-based practices to reduce discrimination in the U.S. workforce, and how to streamline implementation across various occupational types.

Strengths and Limitations

This study was innovative in its look at U.S. workers, determining how workplace discrimination influences long-term changes in psychological distress. It utilized a population-based national sample, strengthening the generalizability of results. Moreover, the sensitivity analysis showed that the associations of workplace discrimination and psychological distress remained significant over time, supporting the robustness of findings. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were also followed for reporting study methods and findings (see Supplementary Materials B, <http://links.lww.com/JOM/B636>, Table 1).⁷⁶

A limitation of this study is that some participants who were lost to follow-up were left out of this analysis, and our findings might be tempered by a degree of selection bias. Specifically, Chi-square test and t-test comparing participants that followed-up in MIDUS III and participants who were lost to follow-up revealed a significant difference by educational

attainment ($p < 0.0001$), marital status ($p = 0.01$), current smoking status ($p < 0.0001$), and psychological distress ($p = 0.0194$), as well as a marginal difference by race ($p = 0.05$) and annual household income ($p = 0.0576$). However, no obvious difference was observed for workplace discrimination (see Supplementary Materials A, <http://links.lww.com/JOM/B635>, Table 3). Finally, the measures of exposure and outcome variables of this study were based on self-report, and the common method variance might bias the associations which were observed in this study.⁷⁷

CONCLUSION

Results using data from the longitudinal MIDUS study provide evidence that workplace discrimination at baseline was associated with increased levels of psychological distress over a nine-year period. Findings elucidate the need for U.S. organizations to actively prevent discrimination which may improve workers' mental health consequently. Considerations to achieve this may include creation of organizational policies, advocacy for their workers, and offering educational training. Making organizational changes in a commitment to diversity will in turn, support the workability of their workforce by contributing towards decreased psychological distress. Future research efforts may continue exploring best ways to implement organizational interventions across various occupational types to mitigate workplace discrimination.

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FIGURE LEGEND

FIGURE 1: Flowchart illustrating participant selection for this study. Participants were identified from the Midlife in the United States (MIDUS) study,⁵⁴ who were currently employed with full data on workplace discrimination, covariates, psychological distress, and follow-up in MIDUS III. Participants were excluded if they were not currently working, had missing data of interest in MIDUS II, were lost to follow-up, or had missing data in MIDUS III. The final sample for analyses was 1,546.

ACCEPTED

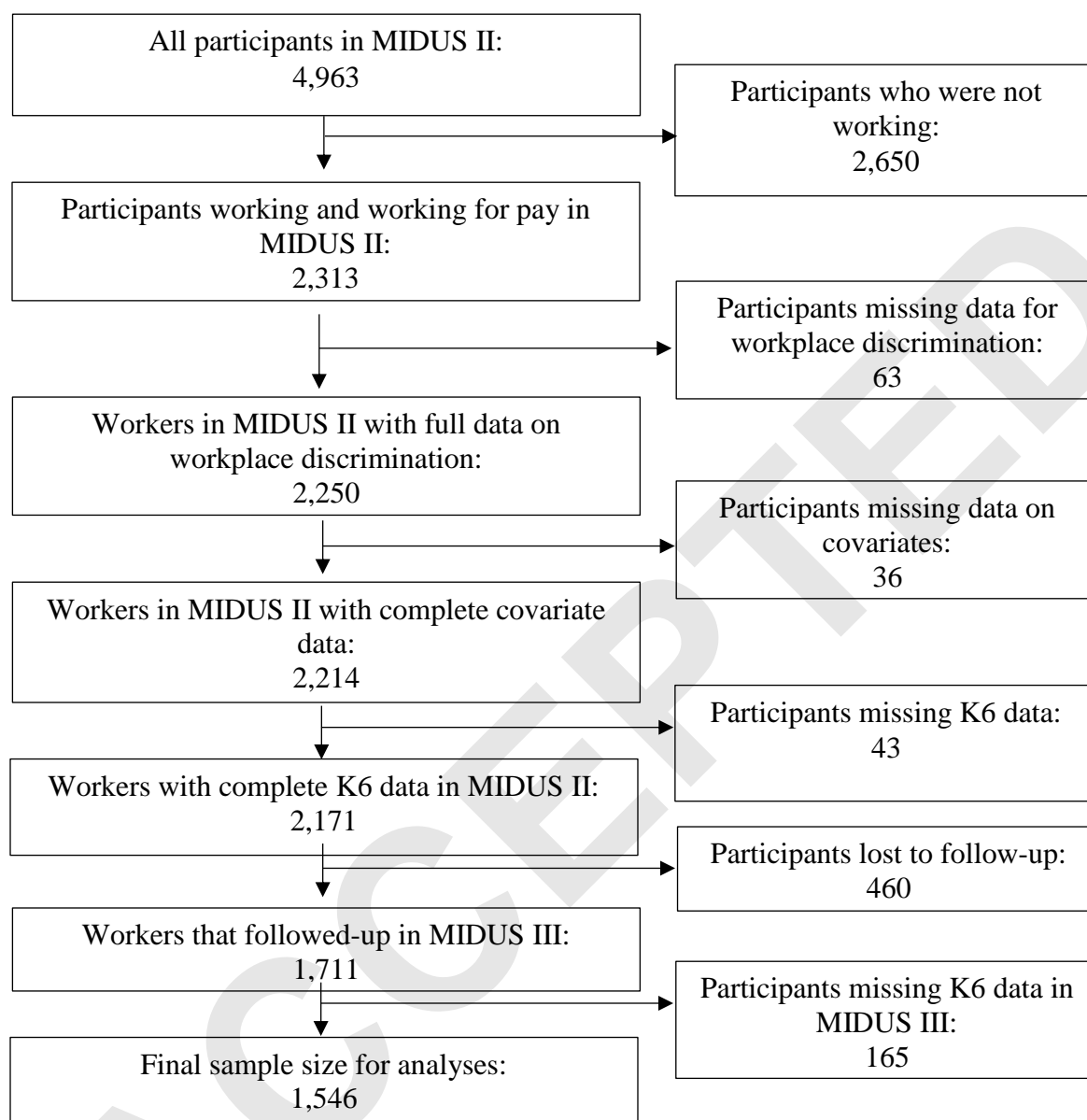


FIGURE 1. Sample Size Selection

TABLE 1. Sample Characteristics at MIDUS II (N = 1,546)

Variables	N (%)
Age (years) (M ± SD)	51.13 ± 9.13
≤45	467 (30.21%)
46-55	595 (38.49%)
≥56	484 (31.31%)
Sex	
Men	762 (49.29%)
Women	784 (50.71%)
Race	
White	1441 (93.21%)
Black	44 (2.85%)
Other	61 (3.95%)
Marital Status	
Married	1145 (74.06%)
Never Married	138 (8.93%)
Other	263 (17.01%)
Educational Attainment	
High School or Less	371 (24.00%)
Some College	419 (27.10%)
University Degree or More	756 (48.90%)
Annual Household Income (US dollars)	
<60,000	560 (36.22%)
60,000-99,999	502 (32.47%)
≥100,000	484 (31.31%)
Current Smoking	
No	1351 (87.39%)
Yes	195 (12.61%)
Alcohol Consumption	
No or Light	910 (58.86%)
Moderate or Heavy	636 (41.14%)
Physical Exercise	
Low	735 (47.54%)
High	811 (52.46%)
Psychological Distress (M ± SD)	2.64 ± 2.87

TABLE 2. Mean Psychological Distress at Baseline and Follow-up by Workplace Discrimination at Baseline

Workplace Discrimination at Baseline	Psychological Distress (Mean \pm SD)	
	K6 at Baseline	K6 at Follow-up
Low (n = 441)	2.03 \pm 2.41	1.88 \pm 2.59
Intermediate (n = 584)	2.41 \pm 2.63	2.21 \pm 2.71
High (n = 521)	3.43 \pm 3.28	3.28 \pm 3.48

ACCEPTED

TABLE 3. Associations of workplace discrimination at baseline with changes in psychological distress between baseline and follow-up

Workplace Discrimination	Crude Model		Model I		Model II		Model III	
	β (95% CI).	<i>p</i>	β (95% CI).	<i>p</i>	β (95% CI).	<i>p</i>	β (95% CI).	<i>p</i>
Low	0.000		0.000		0.000		0.000	
Intermediate	0.119 (-0.193, 0.432)	0.4545	0.040 (-0.273, 0.354)	0.8002	0.062 (-0.251, 0.375)	0.6980	0.052 (-0.260, 0.364)	0.7441
High	0.633 (0.307, 0.959)	0.0001	0.508 (0.174, 0.841)	0.0029	0.474 (0.140, 0.808)	0.0055	0.447 (0.115, 0.780)	0.0084

General linear model regression

β coefficients and 95% confidence intervals (CIs).

Crude Model: adjustment for psychological distress at baseline.

Model I: Crude Model + additional adjustment for age, sex, marital status, and race at baseline.

Model II: Model II + additional adjustment for educational attainment and annual household income at baseline.

Model III: Model III + additional adjustment for smoking, alcohol consumption, and physical exercise at baseline.

Supplementary Tables A

TABLE 1. Discrimination Survey Questions on Workplace Discrimination

Question	Answer Options
1. “How often do you think you are unfairly given the jobs that no one else wanted to do?”	Once a week+ Few times a month Few times a year Less once a year Never
2. How often are you watched more closely than other workers?”	Once a week+ Few times a month Few times a year Less once a year Never
3. “How often does your supervisor or boss use ethnic, racial, or sexual slurs or jokes?”	Once a week+ Few times a month Few times a year Less once a year Never
4. “How often do your coworkers use ethnic, racial, or sexual slurs or jokes?”	Once a week+ Few times a month Few times a year Less once a year Never
5. “How often do you feel that you are ignored or not taken seriously by your boss?”	Once a week+ Few times a month Few times a year Less once a year Never
6. “How often has a coworker with less experience and qualifications gotten promoted before you?”	Once a week+ Few times a month Few times a year Less once a year Never

TABLE 2. Associations of Continuous Workplace Discrimination at Baseline with Changes in Psychological Distress Between Baseline and Follow-up

Continuous Workplace Discrimination	Crude Model		Model I		Model II		Model III	
	β (95% CI).	<i>p</i>	β (95% CI).	<i>p</i>	β (95% CI).	<i>p</i>	β (95% CI).	<i>p</i>
Increase per unit	0.086 (0.055, 0.117)	<0.0001	0.076 (0.044, 0.108)	<0.0001	0.070 (0.038, 0.102)	<0.0001	0.068 (0.036, 0.100)	<0.0001

General linear model regression

β coefficients and 95% confidence intervals (CIs).

Crude Model: adjustment for psychological distress at baseline.

Model I: Crude Model + additional adjustment for age, sex, marital status, and race at baseline.

Model II: Model I + additional adjustment for educational attainment and annual household income at baseline.

Model III: Model II + additional adjustment for smoking, alcohol consumption, and physical exercise at baseline.

TABLE 3. Baseline Characteristics of Participants who Followed-Up in MIDUS III and Participants Lost at Follow-Up

Variable		Subjects who were followed up (n = 1711)	Subjects who were lost at follow-up (n = 460)	<i>p</i>
Age Group	≤45	534 (31.21%)	160 (34.78%)	0.2958
	46-55	653 (38.16%)	161 (35.00%)	
	≥56	524 (30.63%)	139 (30.22%)	
Sex	Men	842 (49.21%)	236 (51.30%)	0.4253
	Women	869 (50.79%)	224 (48.70%)	
Race	White	1591 (92.99%)	412 (89.57%)	0.0505
	Black	49 (2.86%)	19 (4.13%)	
	Other	71 (4.15%)	29 (6.30%)	
Marital Status	Married	1276 (74.58%)	319 (69.35%)	0.0127
	Never Married	150 (8.77%)	37 (8.04%)	
	Other	285 (16.66%)	104 (22.61%)	
Educational Attainment	High School or Less	415 (24.25%)	164 (35.65%)	<.0001
	Some College	464 (27.12%)	146 (31.74%)	
	University Degree or More	832 (48.63%)	150 (32.61%)	
Annual Household Income (US dollars)	<60,000	611 (35.71%)	187 (40.65%)	0.0576
	60,000-99,999	560 (32.73%)	152 (33.04%)	
	≥100,000	540 (31.56%)	121 (26.30%)	

Current Smoking	No	1488 (86.97%)	362 (78.70%)	<.0001
	Yes	223 (13.03%)	98 (21.30%)	
Alcohol Consumption	No or Light	1001 (58.50%)	275 (59.78%)	0.6208
	Moderate or Heavy	710 (41.50%)	185 (40.22%)	
Physical Exercise	Low	817 (47.75%)	237 (51.52%)	0.1507
	High	894 (52.25%)	223 (48.48%)	
Workplace Discrimination	Low	488 (28.52%)	139 (30.22%)	0.3414
	Intermediate	640 (37.41%)	155 (33.70%)	
	High	583 (34.07%)	166 (36.09%)	
Psychological distress	Mean ± SD	2.69 ± 2.92	3.08 ± 3.28	0.0194 ^a

Differences were examined by chi-square test for categorical variables, and t-test for continuous variable.

^a Satterthwaite

Supplementary Materials B

TABLE 1. STROBE Checklist

Item No		Recommendation	Page No
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Title page
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	1
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	3-6
Objectives	3	State specific objectives, including any prespecified hypotheses	6
Methods			
Study design	4	Present key elements of study design early in the paper	7
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	7
Participants	6	(a) <i>Cohort study</i> —Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up <i>Case-control study</i> —Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls <i>Cross-sectional study</i> —Give the eligibility criteria, and the sources and methods of selection of participants	7 and Figure 1
		(b) <i>Cohort study</i> —For matched studies, give matching criteria and number of exposed and unexposed <i>Case-control study</i> —For matched studies, give matching criteria and the number of controls per case	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	3-6
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of	7-8

		assessment methods if there is more than one group	
Bias	9	Describe any efforts to address potential sources of bias	13-14
Study size	10	Explain how the study size was arrived at	7 and Figure 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	8
Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	8
		(b) Describe any methods used to examine subgroups and interactions	8
		(c) Explain how missing data were addressed	7
		(d) <i>Cohort study</i> —If applicable, explain how loss to follow-up was addressed <i>Case-control study</i> —If applicable, explain how matching of cases and controls was addressed <i>Cross-sectional study</i> —If applicable, describe analytical methods taking account of sampling strategy	7
		(e) Describe any sensitivity analyses	7-8
Results			
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	7
		(b) Give reasons for non-participation at each stage	7
		(c) Consider use of a flow diagram	Figure 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	9 and Table 1
		(b) Indicate number of participants with missing data for each variable of interest	Figure 1
		(c) <i>Cohort study</i> —Summarise follow-up time (eg, average and total amount)	7
Outcome data	15*	<i>Cohort study</i> —Report numbers of outcome events or summary measures over time	9
		<i>Case-control study</i> —Report numbers in each exposure category, or summary measures of exposure	N/A
		<i>Cross-sectional study</i> —Report numbers of outcome events or summary measures	N/A
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which	9-10

		confounders were adjusted for and why they were included	
		(b) Report category boundaries when continuous variables were categorized	8
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	10
Discussion			
Key results	18	Summarise key results with reference to study objectives	11
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	13-14
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	11-13
Generalisability	21	Discuss the generalisability (external validity) of the study results	13
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	7 and Title page

What is the relationship over time between workplace discrimination and psychological distress among midlife U.S. workers?

1,546 workers from the Midlife in the United States (MIDUS) study responded over a 9-year period.



Results suggest there is an association between high levels of workplace discrimination at baseline and increased psychological distress at follow-up.

Organizations may consider actively preventing discrimination, which may improve workers' overall mental health.



Discrimination in the Workplace Linked to Psychological Distress: A Longitudinal Study in the United States

Elizabeth Keller, PhD, RN; Megan Guardiano, MS, RN, PHN; & Jian Li, MD, PhD



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