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Workplace discrimination and risk of alcohol abuse: a prospective cohort study in the United States

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ABSTRACT

Objective: Prospective studies on the link between workplace discrimination and subsequent alcohol abuse remain markedly sparse. We aimed to address this gap and to expand the current evidence base by exploring i) the potential explanatory role of psychological stress and ii) gender differences.
Methods: We included 1097 workers from the Midlife in the United States (MIDUS) study without alcohol abuse at baseline (2004–2006) followed up in 2013–2014. Workplace discrimination at baseline was measured using a validated 6-item instrument and categorized into three levels by tertiles. Alcohol abuse at both baseline and follow-up was assessed using a modified 4-item Michigan Alcoholism Screening Test. We applied multivariable Poisson regression to estimate associations in terms of risk ratios (RRs) for and 95% confidence intervals (CIs). Multivariable RRs were additionally adjusted for a measure of psychological stress (i.e., Kessler 6 scale) and gender differences were examined by interaction terms.
Results: The risk of alcohol abuse was increased 2.6-fold in those reporting high workplace discrimination as compared to those with low levels (RR=2.60, 95% CI=1.10–6.15). Stress explained this association only marginally (i.e., RRs for high workplace discrimininationn were attenuated by 14.47%). Associations did not differ between women and men (i.e., p-values for all interaction terms were > 0.05)
Conclusion: Our findings suggest that workplace discrimination is an important risk factor for alcohol abuse among US workers, highlighting the need for organizational interventions to address discrimination at the workplace.

Glossary

CI	Confidence Interval
MAST	Michigan Alcoholism Screening Test
MIDUS	Midlife in the United States study
RR	Risk Ratio

1. Introduction

Discrimination implies that one person is treated less favorably than others based on individual characteristics such as perceived gender, age, ethnicity, disability, religion, or sexual orientation (Gervais, 2012). The experience of discrimination has been linked to poor health, in particular mental health and unhealthy behaviors (Krieger, 2014). Discrimination can be experienced across different domains of life. Examples of discrimination in one's working life include disadvantages related to hiring, firing and training opportunities (Gervais, 2012). Women are particularly affected by limited promotion opportunities (i.e., "glass ceiling") and unfair pay (i.e., "gender pay gap") due to long-standing structural biases and gender norms (Prakash et al., 2024). Discrimination can also manifest itself in interpersonal relationships at the workplace, ranging from overt harassment (e.g., sexual or verbal violence) to more subtle microaggressions (e.g., incidental remarks or assignment of unchallenging tasks) (Jones et al., 2017). Just like discrimination at

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large, workplace discrimination constitutes a risk factor for poor mental and physical health (Clausen et al., 2022; Keller et al., 2024; Li et al., 2023; Marchiondo et al., 2019).

Growing, but yet sparse evidence has suggested that discrimination is also a risk factor for alcohol abuse (Gilbert and Zemore, 2016). This link is theoretically straightforward: discrimination can be conceptualized as a stressor (Gilbert and Zemore, 2016; Krieger, 2014; Thrasher et al., 2016), e.g., based on the Transactional Stress Model (Lazarus and Folkman, 1984). Alcohol consumption, in turn, may be conceptualized as a maladaptive coping behavior in response to stressful workplace discrimination (Gilbert and Zemore, 2016; Lazarus and Folkman, 1984). However, prior research (Baek et al., 2025; Chavez et al., 2015; Thrasher et al., 2016; Yen et al., 1999) on workplace discrimination and alcohol abuse has not yet addressed the explanatory role of stress.

To our knowledge, three prior cross-sectional studies, all from the US, have been published (Chavez et al., 2015; Thrasher et al., 2016; Yen et al., 1999) with mixed findings: evidence of a statistically significant positive association was found in the full study sample of one study carried out among hospital staff (Thrasher et al., 2016). By contrast, in another study among urban transit operators, positive associations were found only in one subgroup or for certain types of discrimination (Yen et al., 1999). The third study drew on the large Behavioral Risk Factor Surveillance System ($n > 70{,}000$), but found only very weak associations in the overall sample (Chavez et al., 2015). Due to their cross-sectional design those earlier studies failed to introduce a temporal sequence between workplace discrimination and alcohol consumption and thereby cannot yield insights into potential causality of associations (Rothman et al., 2008). While existing prospective studies overcome this shortcoming, they are limited to a single investigation, that is, a recent study from South Korea which has shown that gender discrimination at work was related to a higher risk of problematic alcohol consumption (Baek et al., 2025). That study sample was restricted to women, however, and therefore the generalizability of those prospective findings to men remains elusive.

We sought to examine the potential link between discrimination at the workplace and alcohol abuse. Specifically, we set out to expand the restricted evidence base by i) providing additional prospective data, ii) examining the explanatory role of stress and, iii) addressing gender differences.

2. Methods

2.1. Study sample

We used data from the Midlife in the United States (MIDUS) study II survey (2004–2006, baseline) and III survey (2013–2014, follow-up). The MIDUS study was initiated in 1994 as a nationally representative longitudinal study to examine psychological, social, and behavioral factors and health among US adults (Radler, 2014). Data were primarily collected via phone interviews through random digit dial and self-administered questionnaires. In total, 4963 individuals participated in the MIDUS II study, and 2313 reported that they were working. Among workers, the response rate at follow-up was 79.1 %. Responders and non-responders at follow-up did not differ significantly in terms of workplace discrimination and alcohol abuse at baseline. We included 2130 workers with complete data on exposure, outcome variables, and covariates. We excluded 113 workers who were categorized as reporting alcohol abuse at baseline. Exclusion of 920 participants who were lost to follow-up or who had invalid information on alcohol abuse at follow-up yielded a final analytic sample size of 1097. This study was reviewed and approved for exemption by the University of California, Los Angeles Institutional Review Board (IRB#23–001,176).

2.2. Measures

Workplace discrimination was measured at baseline with a validated 6-item instrument (Items were: “How often do you think you are unfairly given the jobs that no one else wanted to do?”, “How often are you watched more closely than other workers?”, “How often does your supervisor or boss use ethnic, racial, or sexual slurs or jokes?”, “How often do your coworkers use ethnic, racial, or sexual slurs or jokes?”, “How often do you feel that you are ignored or not taken seriously by your boss?”, “How often has a coworker with less experience and qualifications gotten promoted before you?”) with a Cronbach’s α of 0.76 (Keller et al., 2024). Each item was measured on a 5-point Likert response scale ranging from never (scored as 1) to once a week or more (scored as 5). Discrimination scores were constructed by calculating the sum of the values of the six items. We categorized workplace discrimination into three groups (low, intermediate, and high) by tertile split.

Alcohol abuse was assessed using a modified version of the Michigan Alcoholism Screening Test (MAST) (Selzer et al., 1975). Four alcohol-related problems in the past 12 months were addressed: emotional or psychological problems as a result of alcohol use; strong desire or urge to use alcohol; a great deal of time using/recovering; using more to get the same effect. The response option for each alcohol-related problem was yes or no. Alcohol abuse was defined as a positive response to at least one of the four items. The Cronbach’s α coefficient of the MAST measure ranged from 0.70 to 0.73 in the MIDUS II and III surveys (Glei et al., 2020).

Several sociodemographic factors and health-related behaviors were measured at baseline, including gender, age (<46; 46 to 55; and ≥56 years old), race (white; black; others), marital status (married; never married; and others), educational attainment (high school or less; some college; university degree or more), household annual income (<$60,000; $60,000- $99,999; ≥$100,000), current smoking (no; yes), alcohol drinking frequency (no; light; moderate; heavy), and leisure-time physical activity (low; high) (Goldwater et al., 2019; Liu et al., 2022). In addition, we adjusted for a measure of psychological stress at baseline, that is, the established Kessler 6 scale (Kessler et al., 2010) which provides a summary score with a potential range from 0 to 24 points. In the current study, the Cronbach's α was 0.82 at baseline.

2.3. Statistical analysis

First, descriptive statistics were generated for characteristics of the study sample. Second, prospective associations of workplace discrimination at baseline with risk of alcohol abuse at follow-up were estimated using modified Poisson regression. The results were expressed as risk ratios (RRs) with 95 % confidence intervals (CIs) (Zou, 2004). Model I was adjusted for age, gender, race, marital status, educational attainment, and household income at baseline. Further adjustment for baseline smoking, alcohol drinking frequency, and leisure-time physical activity was added in Model II. Model III additionally adjusted for stress at baseline to examine whether this factor may act as an intermediate factor. This would imply that the RRs for workplace discrimination and alcohol abuse would be attenuated when stress is added to the statistical models. Further, we assessed trends across levels of workplace discrimination by entering an ordinal variable in separate statistical models. We also examined whether associations differed by gender by entering interaction terms (i.e., workplace discrimination x gender) into the statistical models. Separate RRs for women and men are not reported as these could not be calculated (i.e., Model III) due to the low number of incident cases. All analyses were conducted using SAS version 9.4 (SAS Institute Inc., Cary, NC, USA), and the α level was set at 0.05.

3. Results

Mean age was 50.82 years (standard deviation = 8.88) and the majority of the sample was 46 years old or above. Half were women and the vast majority self-identified as white (see Table 1). Three-quarters were married and educational and income levels were relatively high. The majority was non-smoking, reported light to moderate alcohol

Table 1
Characteristics of study participants at baseline.

Variables		
Age (years), mean (standard deviation)		50.82 (8.88)
Age (years), n (%)	≤45	334 (30.45)
	46–55	433 (39.47)
	≥56	330 (30.08)
Gender, n (%)	Men	536 (48.86)
	Women	561 (51.14)
Race, n (%)	White	1028 (93.71)
	Black	27 (2.46)
	Others	42 (3.83)
Marital status, n (%)	Married	827 (75.39)
	Never married	95 (8.66)
	Others	175 (15.95)
Educational attainment, n (%)	High school or less	229 (20.87)
	Some college	299 (27.26)
	University degree or more	569 (51.87)
Annual household income (US $), n (%)	<60,000	351 (32.00)
	60,000–99,999	354 (32.27)
	≥100,000	392 (35.73)
Current smoking, n (%)	No	968 (88.24)
	Yes	129 (11.76)
Alcohol drinking frequency, n (%)	No	196 (17.87)
	Light	352 (32.09)
	Moderate	467 (42.57)
	Heavy	82 (7.47)
Leisure-time physical activity, n (%)	Low	457 (43.30)
	High	622 (56.70)
Psychological distress, mean (standard deviation)		2.61 (2.71)

consumption and high physical activity levels.

The cumulative incidence of alcohol abuse was 4.19 % (46/1097). As shown in Table 2, the cumulative incidence increased with increasing levels of workplace discrimination. Distress attenuated the RRs marginally (i.e., by 14.47 % when comparing RRs for high workplace discriminaiton estimated by Model III vs Model II). Based on the fully adjusted model, the risk of alcohol abuse was elevated by 37 % in those reporting intermediate versus low levels of workplace discrimination, though this association was not statistically significant (RR=1.37, 95 % CI=0.73–2.58). The risk of alcohol abuse was 2.6-fold elevated in those reporting high workplace discrimination as compared to those with low levels (RR=2.60, 95 % CI=1.10- 6.15). The p-value for trend was significant ($p = 0.02$), suggesting a dose-response relationship between workplace discrimination and alcohol abuse. Associations did not differ between women and men (i.e., p-values for all interaction terms were >0.05)

4. Discussion

The present study found that workplace discrimination is associated with an increased risk of alcohol abuse across nine years. This relationship was observed irrespectively of psychological stress and did not differ between women and men.

Our finding of a 2.6-fold elevated risk of alcohol abuse among individuals reporting high versus low workplace discrimination is in line with observations from the only prior prospective study: that study measured workplace discrimination also by three levels and found that the highest level (versus the lowest) was associated with a 2.1-fold increased risk of alcohol abuse (Baek et al., 2025). As mentioned in Section 1, that prior study was conducted among women in South Korea and specifically addressed gender-based workplace discrimination. Our study adds to that prospective evidence and additionally explored a potential stress pathway (see below) and effect-modification by gender (i.e., no evidence of gender differences). In addition, we expand the prospective evidence from an Asian study population to the US population (i.e., with likely different cultural norms relevant to discrimination) (Baek et al., 2025) and beyond gender-based workplace discrimination. Notably, our study measured workplace discrimination differently, that is, in terms of the frequency and different types of experienced incidents. Some of those incidents can be conceptualized as microaggressions (e.g., jokes, feeling ignored). Microaggressions are subtle and ambiguous, which makes them difficult to notice with certainty and may reduce the likelihood that victims take action (Lindsey et al., 2015) (e.g. by confronting perpetrators, liaising with potential formal or informal allies or by reporting incidents). As outlined in Section 1, alcohol abuse could be conceptualized as a mal-adaptive behavioral coping response to the stress induced by workplace discrimination. Yet, stress explained at most a small fraction of the observed association in our study. Only one prior study, which was cross-sectional, has also adjusted its estimate for stress and still found a strong positive link between workplace discrimination and alcohol abuse (Thrasher et al., 2016). Though statistical support is currently lacking, the hypothesized stress-pathways should not be discarded due to methodological shortcomings (see below).

Our findings highlight the need for workplace anti-discrimination policies and interventions. Companies should routinely monitor workplace discrimination (e.g., using anonymous staff surveys) to identify whether interventions are needed and to evaluate their impact. They can demonstrate a clear commitment to equity by fostering a respectful, inclusive working environment and adopting strong anti-discrimination policies. Practical measures include i) training to increase awareness among managers and staff and to strengthen team cohesion; ii) standardization and transparency of processes for hiring, promotion, firing, and task assignment; and iii) establishing confidential contact points where employees can report incidents, seek consultation, request mediation, or initiate formal action against perpetrators. While the mentioned organizational measures seem to make intuitive sense, evidence for their effectiveness may vary according to the type of intervention and type of discrimination (e.g., relating to age, gender, or race). In some instance the evidence is restricted by limited insights into long-term effects, publication bias (Paluck et al., 2021), and lack of testing in

Tables 2
Prospective associations of workplace discrimination at baseline with risk of alcohol abuse at follow-up in US workers; risk ratios (95 % confidence internals).

		Number of study participants (and incident cases)	Cumulative incidence of alcohol abuse	Model I	Model II	Model III
Workplace discrimination	Low	317 (6)	1.89 %	1.00	1.00	1.00
	Intermediate	406 (16)	3.94 %	1.39 (0.74–2.61)	1.46 (0.78–2.73)	1.37 (0.73–2.58)
	High	374 (24)	6.42 %	2.92 (1.23–6.91)	3.04 (1.28–7.21)	2.60 (1.10-6.15)
	p for trend			0.01	0.01	0.02

Model I: adjustment for demographic factors (age, gender, race, marital status) and socioeconomic status (education, household income) at baseline;.
Model II: Model I + additional adjustment for behavioral factors (smoking, alcohol drinking frequency, and leisure-time physical activity) at baseline;.
Model III: Model II + additional adjustment for psychological distress at baseline.

actual real-life workplace settings (Sinclair et al., 2024). Healthcare providers across settings can also play an important role in addressing the health impact of workplace discrimination. In routine encounters, providers can ask about work-related stressors, including disrespectful treatment at work. When patients describe possible discrimination, providers can validate their experiences, explore links with alcohol use, and collaboratively develop coping strategies. Where appropriate, they can offer brief interventions for risky alcohol use, refer to specialized mental health or addiction care, and signpost patients to employee assistance programs, unions, or legal/advocacy services that can support them in addressing workplace problems.

Key strengths of our study are i) its prospective study design and nationally representative US sample, ii) good response rates at follow-up and lack of evidence of selection bias in terms workplace discrimination and alcohol abuse, and iii) adjustment for various relevant confounders as well as stress. Important limitations are, first, that the data were collected more than a decade ago. Working from home has likely become more common in post Covid-19 working life (Zucconi et al., 2024) for some professions. Given how workplace discrimination was measured in our study working from home might have reduced the likelihood or perception of some workplace discrimination incidents due to limited social interaction (e,g., discriminating jokes or awareness of being monitored more closely than colleagues). A second limitation is that the number of cases was rather small, which limited the statistical power to examine gender differences (i.e., only interaction terms, but not separate estimates for women and men). Future studies with larger samples are thus needed. Thirdly, there was a nine-year time interval between baseline and follow-up. Workplace environments and experiences of discrimination may have changed during this period, but these potential changes were not measured, possibly leading to misclassification of exposure over time and biases in observed associations. Also, prospective studies with three or more measurement points are needed to provide better evidence on the potential intermediate role of stress on the pathway linking workplace discrimination to alcohol abuse. Finally, we cannot rule out that alcohol abuse is underreported due to the associated stigma. We are not aware though of evidence suggesting potential underreporting is associated with workplace discrimination. In case misclassification of alcohol abuse occurred, but was unrelated to workplace discrimination (i.e., non-differential misclassification), associations would have been diluted and thus underestimated in our study.

In conclusion, our study suggests that workplace discrimination is a risk factor for alcohol abuse. Preventing and addressing workplace discrimination should be considered a core component of occupational and public health strategies to reduce alcohol abuse. Future research needs to examine additional psychosocial pathways to alcohol abuse, and test organizational and clinical interventions to mitigate the harmful health consequences of discriminatory work environments.

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Disclaimer

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CRediT authorship contribution statement

Adrian Loerbroks: Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Liwei Chen:** Conceptualization, Writing – review & editing. **Chunqing Lin:** Conceptualization, Writing – review & editing. **Kira Schmidt Stiedenroth:** Conceptualization, Writing – review & editing. **Jian Li:** Conceptualization, Formal analysis, Funding acquisition, Methodology, Visualization, Writing – review & editing.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests: Jian Li reports financial support was provided by Centers for Disease Control and Prevention. If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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