



Workplace discrimination in relation to mental well-being and suicidal ideation

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ABSTRACT

Despite many individuals experiencing discrimination at work, research elucidating the implications of workplace discrimination for mental health is limited. We aimed to estimate the hypothesised dose-response relationships of frequency and number of types of discrimination at work with poor mental well-being and suicidal ideation. We analysed cross-sectional data from 2594 participants (57% male, mean age: 42.3 years, response rate 14.3%) of the 2021 wave of a study examining job quality and well-being in Luxembourg. Participants were asked how often they were exposed to discrimination due to sex, age, ethnicity, religion/worldview, nationality, disability or sexual orientation at work within the last year. They were also asked for suicidal ideation during the last year. Poor mental well-being was measured via the WHO-5 Well-being Index. Logistic regression estimated the associations of reported frequency and number of types of discrimination with poor mental well-being and suicidal ideation. We observed increasing odds of both outcomes in association with increments in the frequency and number of types of discrimination. Compared to participants reporting no experience of discrimination, individuals exposed to discrimination weekly or daily had elevated odds of poor mental well-being (Odds Ratio (OR): 1.73, 95% Confidence Interval (CI): 1.04–2.90) and suicidal ideation (OR: 2.38, 95% CI: 1.21–4.71). Exposure to three types of discrimination was also associated with poor mental well-being (OR: 1.65, 95% CI: 1.02–2.66) and suicidal ideation (OR: 2.33, 95% CI: 1.17–4.64). Even though the design of our analysis does not allow causal conclusions, its results point towards a dose-response relationship between workplace discrimination and poor mental well-being as well as suicidal ideation.

1. Introduction

According to the European Agency for Safety and Health at Work, discrimination occurs when a person is treated less favourably than others because of characteristics such as age, sex, ethnicity or religion (European Agency for Safety and Health at Work, 2022). Individuals can be subjected to discrimination across various areas of daily life including the workplace, e.g., through hiring or promotion practices that disadvantage minoritised groups and through microaggression as well as negative verbal and nonverbal behaviour in intrapersonal relationships at work (Dhanani et al., 2018; Keller et al., 2024). In fact, 5.23 million women and 3.63 million men in the European Union reported experiences of discrimination at work in the 2021 EU Labour Force Survey (Eurostat, 2022). Among the EU member states, the highest proportion of employees feeling discriminated at their workplace were observed in

Luxembourg (17% among women and 14% among men) (Eurostat, 2022). In the United States, estimates for workplace discrimination are as high as up to 25% among black women. These numbers can be expected to even increase in the near future as forces that encourage misogyny and prejudice towards minoritised groups are gaining more and more influence on policies and public debates in many countries (McKee et al., 2025; Ng et al., 2025; Speed and Mannion, 2020).

In terms of potential health implications, psychosocial factors at work (such as experiencing discrimination) are considered as important social determinants of health. Particularly, drawing upon the Stress-as-Offense-to-Self theory (Semmer et al., 2019), we argue that experiencing discrimination at work can act as a social stressor as it directly signals a lack of respect and devaluation of the target, thereby undermining its self-esteem and desire for social belonging. As maintaining both a positive view of oneself (personal self-esteem) and a sense of

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social worth (social self-esteem) is a central motive of individuals, targets of workplace discrimination may thus appraise it as a direct threat to their identity and basic psychological needs (Semmer et al., 2019; Berjot and Gillet, 2011). As a consequence, targets may not only experience painful emotions tightly bound to the self-image, such as hurt or humiliation, but may also engage in psychological withdrawal or reduced engagement at work in order to protect the threatened self (Semmer et al., 2019).

According to the transactional model of stress (Lazarus and Folkman, 1984), situations that are appraised as a threat can trigger physiological reactions like elevated activity of the autonomic nervous system (ANS) or the hypothalamic-pituitary-adrenal (HPA) axis (Laferton et al., 2023; Seery, 2011). In fact, increased ANS and HPA axis activities have been observed in response to racial discrimination and microaggressions (Goosby et al., 2018; Hara, 2025; Nam et al., 2022). This physiological adaption (allostasis) to stressful stimuli is a normal regulatory process of the body. (McEwen, 1998). In case of constant overstimulation of the allostatic system (allostatic overload) though, regulation can turn into dysregulation which, on the long run, can have detrimental effects on mental health and well-being as well as on physical health (Gou et al., 2025; Li et al., 2024; Mauss et al., 2015).

However, epidemiologic research with regards to the association between exposure to discrimination at work and mental health outcomes is limited (Clausen et al., 2022; Dalexis et al., 2026). There are some studies linking discrimination at work to outcomes like depression (Clausen et al., 2022; Dalexis et al., 2026; Han et al., 2022), anxiety (Dalexis et al., 2026), psychological distress (Keller et al., 2024), poor mental well-being (Di Napoli et al., 2021), post-traumatic stress disorder (Dalexis et al., 2026) or alcohol abuse (Baek et al., 2025). Nonetheless, research gaps remain, including a lack of studies examining a potential dose-response relationship between workplace discrimination and impaired mental health, e.g., by accounting for the frequency with which individuals are exposed to discrimination at work or the number of types of discrimination.

Experiencing various types of discrimination (e.g., because of one's age, gender, and sexual orientation), from our point of view, can be interpreted as a form of cumulative exposure that deserves particular attention. In terms of the allostatic load model, such cumulative exposure to several types of discrimination may be interpreted as leading to repeated "hits" from multiple novel stressors that turn allostatic load to overload and cumulative dysregulation (McEwen, 2000). This aspect is especially important for research on workplace discrimination as multiple discrimination is estimated to be particularly likely to occur in the workplace compared to other everyday settings like the use of health services or dealing with financial institutions (Central Statistics Office, 2025; European Agency for Safety and Health at Work, 2022; European Commission: Directorate-General for Employment Social Affairs and Inclusion, 2007). This might be because work environments inherently feature social and structural dynamics that may potentially act as drivers of discrimination like hierarchical power structures, asymmetric dependency relationships (e.g., between supervisors and employees), constant individual evaluation or competition between individuals for promotion or salary increases (Vinluan et al., 2025; Hazelzet et al., 2022; Vonderlin et al., 2021).

The number of types of workplace discrimination was recently investigated in relation to risk of hypertension (Coates et al., 2024). Comparable analyses focusing on mental health are missing except for one study on workplace discrimination and depressive symptoms in US hospital employees that accounted for the number of types as well as the frequency of discrimination (Hammond et al., 2010). Other studies in the field either focused on only one specific type like discrimination due to age (Marchiondo et al., 2019), gender (Kim et al., 2022) or ethnic background (Dalexis et al., 2026) or evaluated the effect of exposure to any type of discrimination without further specification (Clausen et al., 2022).

Furthermore, there is some, even though not conclusive, evidence

linking job stressors to suicidality (Milner et al., 2018). Such an association would be in line with holistic and integrated models of suicide that account for psychosocial factors like workplace discrimination (Abrutyn and Mueller, 2018; Llosa et al., 2023). One study among Korean women reported an association of gender discrimination in the labour market with suicidal ideation (Chu, 2024) and there are some studies linking other forms of workplace aggression to suicidality. For instance, a large cohort study in Denmark reported an association between bullying and suicidal behaviour among men (Conway et al., 2022). Another prospective cohort study observed an association between sexual harassment at work with suicidal behaviour (Magnusson Hanson et al., 2020) and a pooled analysis of data from three Nordic cohorts implied increased suicide risk in relation to exposure to workplace violence (Magnusson Hanson et al., 2023). Against this backdrop, an association between workplace discrimination and suicidal ideation appears not implausible, but needs further investigation (Llosa et al., 2023).

Looking at the studies mentioned above, we consider it important to keep in mind that there are also other forms of offensive behaviour at the workplace, most notably bullying, which is defined as a repeated and intentional aggression, often based on imbalance of power between the aggressor and the victim (Semmer et al., 2019; Matthiesen and Einarsen, 2010). Bullying is not only an established predictor of mental disorders (Conway et al., 2025), but there is also reason to assume that targets of discrimination may also be of elevated likelihood of being victims of workplace bullying (Okechukwu et al., 2014; Cortina et al., 2013). We thus propose that an analysis examining the putative association between workplace discrimination and mental health outcomes should carefully take into account also the potential role of bullying.

Furthermore, a meta-analysis evaluating the antecedents of bullying concluded that factors relating to the organisational environment are the main predictors of bullying (Cantisano et al., 2007). Against this backdrop, we reckon that also the likelihood of workplace discrimination may at least partly depend on the overall working environment. The latter is shaped by characteristics of employment (e.g., type of contract, income adequacy) as well as work-related psychosocial conditions including demands (e.g., time pressure) and resources to cope with these demands (e.g., social support) (Boot et al., 2024; Frank et al., 2023; Demerouti et al., 2001). Hence, we assume that bullying and psychosocial working conditions could possibly act as confounding variables when analysing the putative mental health implication of exposure to workplace discrimination.

Based upon these considerations, we aimed to examine the following hypotheses:

H1. A higher frequency of experienced discrimination at work is associated with an elevated likelihood of *H1a*: Poor mental well-being, and *H1b*: Suicidal ideation

H2. A higher number of types of experienced discrimination at work is associated with an elevated likelihood of *H2a*: Poor mental well-being, and *H2b*: Suicidal ideation

2. Methods

2.1. Study design and study population

Data come from the eighth wave (2021) of the Quality of Work Luxembourg survey, an annual survey of employees working in Luxembourg (Schütz and Thiele, 2021). The sample included both residents of Luxembourg and cross-border commuters from France, Belgium, and Germany who worked at least 10 h per week for remuneration. The gross sample comprised 18,109 potential participants: a panel sample of 2109 respondents from previous waves and a refreshment sample of 16,000 employees drawn at random from the Luxembourgian national social security register that were invited to the study via mail. A total of 2597 interviews were completed (gross

response rate 14.3%; 47.3% for the panel and 10.0% for the refreshment sample). After exclusion of three technically invalid cases, the analytical sample comprised 2594 respondents.

Data were collected between 11 May and 28 October 2021. Participants completed the survey via computer-assisted telephone interviews (CATI) or computer-assisted web interviews (CAWI). Participation was voluntary, and respondents could withdraw at any time without consequences. Informed consent was obtained from all respondents prior to the start of the survey, either by clicking a box (CAWI) or verbally on the phone (CATI). The questionnaire was available in five languages: Luxembourgish, French, German, English, and Portuguese. The mean interview lasted 26 min.

Since the main exposure of interest of the present analysis (discrimination at work) was not measured in the previous or subsequent waves but only once (i.e., in the 2021 wave), we were only able to analyse cross-sectional data from the 2021 wave.

According to a non-responder analysis applying a logistic model of participation in the refreshment sample ($n = 16,000$) with sex, age group, country of residence, and nationality as predictors, participation was lower among respondents under 30 and those aged 60–64, and among Portuguese and non-EU nationals; country of residence was not significantly associated with participation (Schütz and Thiele, 2021). These estimates were used to construct nonresponse-adjusted design weights (Horvitz–Thompson estimator), which were combined with attrition models for the panel cases and calibrated to known population margins. These weights were applied to align the sample with population benchmarks for age, gender, and residency, assuming conditional representativeness (Schütz and Thiele, 2021). All analyses reported in the manuscript used these weights.

2.2. Exposure assessment

Workplace discrimination was assessed using a self-report measure capturing the frequency of discriminatory experiences at work during the past 12 months. Respondents were asked to indicate how often they had personally experienced discrimination in the workplace due to each of the following characteristics: gender or gender identity, age, ethnic origin, religion or beliefs, nationality, disability or impairment, and sexual orientation. Each item was rated on a five-point frequency scale ranging from 0 (*never*), 1 (*less frequently*), 2 (*monthly*), 3 (*weekly*), to 4 (*daily*). Higher scores indicate more frequent experiences of workplace discrimination.

2.3. Outcome assessment

Poor mental well-being was assessed with the WHO-5 Well-Being Index (Cronbach's $\alpha = .89$) (Sischka et al., 2020; Topp et al., 2015). The tool starts with the following instructions: "Please indicate for each of the five statements which is the closest to how you have been feeling over the last two weeks." The five items are as follows: "Over the last two weeks..." (1) "... I have felt cheerful and in good spirits," (2) "... I have felt calm and relaxed," (3) "... I have felt active and vigorous," (4) "... I woke up feeling fresh and rested," (5) "... my daily life has been filled with things that interest me." The items have the following response options: At no time (0), Some of the time (1), Less than half of the time (2), More than half of the time (3), Most of the time (4), and All of the time (5). Accordingly, participants can have a raw score between 0 and 25, which we then multiplied by four to obtain an Index Score ranging from 0 to 100. A cut-off for the WHO-5 Well-being Index of <50 points was then applied to categorise participants into Poor mental well-being yes vs. no (Topp et al., 2015).

Suicidal ideation was assessed by asking participants whether during the last 12 months they have had suicidal thoughts (no/yes). Participants that gave an affirmative answer were subsequently asked if they have had made concrete suicidal plans. In case this question was also answered with "yes", individuals were then asked if they had made a

suicidal attempt.

2.4. Additional variables

We collected data on a range of sociodemographic and employment characteristics: age, sex, educational attainment, nationality, place of residence, net income during the last month, type of position, and type of employer (Table 1).

Furthermore, we measured various aspects of participants' psychosocial working conditions using scales from the Quality of Work and Quality of Employment Index (Steffgen et al., 2020). Unless specified, a five-point Likert response format ranging from 1 (= *to a very low extent*) to 5 (= *to a very large extent*) was used for all of the following scales. All measures were scored by calculating the mean across their respective scale items. Consequently, higher scores represent greater levels of the underlying construct being assessed.

Autonomy was measured by four items (Cronbach's $\alpha = .78$) reflecting if an employee has ample opportunities to do his/her work autonomously/or in an autonomous manner. A sample item is "To what extent can you decide how you carry out your work?"

Time pressure was measured by two items ($\alpha = .77$) asking if work is done under pressure. A five-point Likert scale ranging from 1 (= *never*) to 5 (= *almost always*) was applied. A sample item is "How often are you under time pressure or rushed in your work?"

Social support was assessed by four items ($\alpha = .84$) measuring if an employee gets social support from others at work. A sample item is "To what extent are you supported in your work by your colleagues?"

Bullying was assessed via the Luxembourg Workplace Mobbing Scale (LWMS; $\alpha = .79$) (Sischka et al., 2021; Steffgen et al., 2016) that contains five items ("criticised", "ignored", "absurd duties", "ridiculed", "conflicts"). Employees were asked to indicate how often they encountered each situation on a five-point Likert scale, ranging from 1 (= *never*) to 5 (= *almost always*). A sample item is "How often are you ignored at work by your colleagues or your superior?"

The *Quality of Employment* scales assessed six dimensions, i.e., training opportunities, career advancement, job security, employability, and income satisfaction. Training opportunities was measured by two items ($\alpha = .83$) asking if employees have the opportunity to be involved in formation. A sample item is "To what extent do you have possibilities to engage in further training in your organization?". Career advancement was measured by two items ($\alpha = .87$) asking if employees are having the opportunity to get promoted by the employer. A sample item is "To what extent do you have possibilities of advancement and promotion in your organization?". Job security was measured by two items ($\alpha = .76$) asking the extent to which employees consider their job to be safe. A sample item is "To what extent do you consider your own job as being safe?". Employability was measured by two items ($\alpha = .83$). Participants were asked to indicate on a five-point Likert scale how difficult they would consider finding a new job (1 = *not difficult at all*, 5 = *very difficult*). A sample item is "How difficult would it be for you to find a similar job, if you were to lose or resign from your job?". Income satisfaction was measured by two items ($\alpha = .86$) asking if employees are satisfied with their income (1 = *to a very low extent satisfied*, 5 = *to a very large extent satisfied*). A sample item is "How satisfied are you at present with your salary?". For further analysis, the scales were added to calculate a *Quality of Employment* index score.

2.5. Statistical analysis

We present summary statistics for the characteristics of the study population, providing means and standard deviations (SD) for continuous variables and absolute (n) and relative (%) frequency for categorical variables. We also calculated the Pearson correlation coefficient for the correlation between the bullying score and frequency as well as number of types of discrimination.

To examine the hypotheses outlined above, we used logistic

Table 1
Characteristics of the study population (N = 2594).

Variable	Missing (n)	Mean (SD)	Minimum - Maximum
Age (years)	0	42.3 (10.6)	19 - 68
Net income (EUR) ^a	88	4515.1 (6487.2)	0 - 96000
Time pressure	1	3.5 (0.9)	1.0 - 5.0
Autonomy	0	2.9 (0.9)	1.0 - 5.0
Social support	25	3.7 (0.9)	1.0 - 5.0
Bullying	12	1.8 (0.6)	1.0 - 4.8
Variable	Missing (n)	n	%
Sex	0		
Female		1119	43.1
Male		1475	56.9
Nationality	0		
Luxembourgian		730	28.1
French		613	23.6
German		495	19.1
Portuguese		109	4.2
Belgian		422	16.3
Italian		45	1.7
Other		177	6.8
Stateless		3	0.1
Place of residence	2		
Luxemburg		1095	42.2
France		534	20.6
Germany		528	20.4
Belgium		432	16.7
Other		3	0.1
Educational attainment	1		
No qualification		21	0.8
Primary school		35	1.3
Secondary school		232	8.9
A-levels		323	12.5
Vocational training		316	12.2
Master craftsman training		158	6.1
Technical training		161	6.2
University degree (Bachelor's)		499	19.2
University degree (Master's)		798	30.8
Doctorate		50	1.9
Current form of occupation	0		
Employee		2283	88.0
Civil servant		305	11.8
Freelancer		3	0.1
Assisting family member		3	0.1
Type of working contract	0		
Permanent		2509	96.7
Fixed-term		63	2.4
Temporary work		12	0.5
Other		10	0.4
Type of position	4		
Full-time		2087	80.5
Part-time		457	17.6
Other		46	1.8
Type of employer	8		
Private company		1785	68.8
Public authority (Luxembourgian)		589	22.7
Public authority (European/International)		95	3.7
Non-government organisation		117	4.5
Frequency of discrimination	0		
Never		1753	67.6
Less than monthly		628	24.2
Monthly		114	4.4
Weekly or daily		99	3.8
Number of types of discrimination	0		
0		1753	67.6
1		404	15.6
2		214	8.2
3		104	4.0
4 or more		119	4.6

Table 1 (continued)

Variable	Missing (n)	Mean (SD)	Minimum - Maximum
WHO-5 Well-being Index score ^b	8		
< 50 points		995	38.4
≥ 50 points		1591	61.3
Suicidal ideation ^c	6		
No		2440	94.1
Yes		148	5.7

SD, standard deviation.

^a Net income from main occupation during last month.^b Mean: 54.9 (SD: 20.8, Min: 0, Max: 100).^c During last 12 months before the interview.

regression that included frequency of discrimination (never (reference category), less than monthly, monthly, weekly or daily) as exposure variable for **H1** and number of types of discrimination (0 (reference category), 1, 2, 3, 4 or more types) as exposure variable for **H2**. Outcome variables were poor mental well-being (yes vs. no) and suicidal ideation (yes vs. no). For each exposure variable, we ran separate logistic regression models that were built as follows: First, we examined the crude association between the respective exposure and outcome variables (Model 1). In Model 2, we added the sociodemographic and employment characteristics age (years, continuous), sex (female vs. male), educational attainment (university degree yes vs. no), nationality (Luxembourgian vs. other), place of residence (Luxemburg vs. other), net income (EUR, continuous), type of position (full time vs. other), type of employer (private company vs. public authority/NGO). Model 3 then additionally included the variables relating to psychosocial working conditions: time pressure, autonomy, social support, quality of employment (all of them continuous). Ultimately, we added the mean score for workplace bullying (Model 4). The rationale for adding bullying separately to the model was that because of a conceptual relatedness to workplace discrimination (Rosander et al., 2025) and as another important workplace threat (Nielsen and Einarsen, 2012; Tuckey et al., 2015), we expected this variable to be an especially relevant confounder that deserves particular attention. All adjusted models additionally included the variable weighting for non-response and provided Odds Ratios (OR) with 95% Confidence Intervals (CI).

Furthermore, we performed the following sensitivity analyses: First, we repeated all models without weighting for non-response. Secondly, we changed the outcome variables to poor mental well-being based on a the WHO-5 Well-being Index more conservative cut-off (≤28 points) (Topp et al., 2015) and concrete suicide plans (yes vs. no).

Since the number of missing observations was very small (<5%) for each variable, we performed complete-case analyses. All analyses were conducted using SPSS version 29.0 (IBM, Armonk, NY, USA).

3. Results

3.1. Characteristics of the study population

Mean age of the participants (N = 2594) was 42.3 years (SD: 10.6 years) and more than half of them (56.9%) were male. Slightly more than a quarter of the participants (28.3%) were Luxembourgian nationals while 23.6% were French and 19.1% German. Less than half of them (42.2%) lived in Luxembourg as many individuals were commuters from France (20.6%), Germany (20.4%) or Belgium (16.7%). About half of the participants had a university degree. Concerning their employment situation, most participants were employees (88.0%), had a permanent employment contract (96.7%) and worked full time (80.5%). In terms of psychosocial working conditions, individuals on average reported medium levels of autonomy (mean: 2.9, SD: 0.9) and rather good social support (mean: 3.7, SD: 0.9). The mean score for bullying was 1.8 (SD: 0.6; scales for all these variables ranging from 1 to 5)

(Table 1).

3.2. Exposure to workplace discrimination

More than a quarter of the participants indicated at least some experience of discrimination at work during the last 12 months before the interview. 213 individuals (8.2%) reported discrimination on a monthly or more frequent level. Exposure to multiple discrimination (at least 2 types) was indicated by 16.8% of the participants (Table 1). The most reported types were discrimination because of age, sex and nationality (Supplement A, Table S1). Bullying was moderately correlated to the number of types of discrimination (correlation coefficient: 0.39) and frequency of discrimination (correlation coefficient: 0.40).

3.3. Prevalence of poor mental well-being and suicidal ideation

On average, participants had a WHO-5 Well-being Index score of 54.9 (SD: 20.8, range: 0–100). A score below 50 points (poor mental well-being) was measured in 38.4% of the participants. 14.1% of the individuals had a score equal to or below the more conservative threshold of 28 points. Suicidal ideation during the last year was reported by 5.7% of the participants (Table 1). 79 of them (3.0% of the total study population) indicated that these thoughts had turned into concrete suicide plans and 7 individuals (0.3%) reported a suicidal attempt.

3.4. Association of discrimination with poor mental well-being and suicidal ideation

Across all models, we observed a tendency towards increasing odds of poor mental well-being and suicidal ideation from the lowest to the highest exposure categories for both frequency and number of types of discrimination (Tables 2 and 3).

Concerning frequency of discrimination, the crude estimate for the association between the highest exposure category (weekly or daily discrimination) and poor mental well-being was OR: 4.88 (95% CI: 3.14–7.57). The corresponding OR for suicidal ideation was 5.34 (95% CI: 3.00–9.92). These associations attenuated when adjusting for the variables related to psychosocial working conditions, particularly workplace bullying. Even after adjustment for bullying though, weekly or daily discrimination was still associated with poor mental well-being (OR: 1.73, 95% CI: 1.04–2.90) as well as suicidal ideation (OR: 2.38, 95% CI: 1.21–4.71) (Table 2). Bullying was associated with poor mental well-being (OR: 1.86, 95% CI: 1.55–2.23) as well as suicidal ideation (OR: 1.54, 95% CI: 1.15–2.08).

Concerning the number of types of discrimination, the crude effect estimated attenuated when adding the confounding variables, most notably workplace bullying. Nonetheless, exposure to three types of discrimination was associated with poor mental well-being (OR: 1.65, 95% CI: 1.02–2.66) and suicidal ideation (OR: 2.33, 95% CI: 1.17–4.64) even in the fully adjusted model. Individuals reporting four or more types of discrimination at work had more than twice the odds of suicidal ideation compared to participants that felt not discriminated (OR: 2.19, 95% CI: 1.16–4.13) (Table 3). Also in these models, bullying was associated with both outcomes (poor mental well-being: OR: 1.88, 95% CI: 1.57–2.26; suicidal ideation: OR: 1.58, 95% CI: 1.17–2.12).

In the sensitivity analyses, removing the variable weighting for non-response did not lead to any noteworthy change in the effect estimates across all models (Supplement B, Tables S2 and S3). When using poor mental well-being based on the lower cut-off (≤ 28 points) for the WHO 5 Well-being Index as outcome variable, we observed less evidence for an association than in the main analysis (with respect to both frequency and number of types of discrimination). The same applies to the models replacing suicidal ideation with concrete suicide plans as outcome (Supplement B, Tables S4 and S5).

Table 2

Results from the logistic regression models estimating the association of frequency of workplace discrimination with poor mental well-being (H1a) and suicidal ideation (H1b).

	Poor mental well-being		Suicidal ideation	
	OR	95% CI	OR	95% CI
Model 1				
Frequency of discrimination				
Never	Reference		Reference	
Less than monthly	1.88	1.56 – 2.26	2.13	1.46 – 3.12
Monthly	3.63	2.45 – 5.39	3.81	2.10 – 6.91
Weekly or daily	4.88	3.14 – 7.57	5.34	3.00 – 9.52
Model 2				
Frequency of discrimination				
Never	Reference		Reference	
Less than monthly	1.79	1.48 – 2.17	2.32	1.56 – 3.45
Monthly	3.21	2.14 – 4.80	4.14	2.24 – 7.65
Weekly or daily	4.79	3.04 – 7.57	5.25	2.86 – 9.64
Model 3				
Frequency of discrimination				
Never	Reference		Reference	
Less than monthly	1.30	1.06 – 1.60	1.88	1.25 – 2.83
Monthly	1.74	1.12 – 2.69	2.78	1.45 – 5.31
Weekly or daily	2.32	1.42 – 3.80	3.10	1.62 – 5.92
Model 4				
Frequency of discrimination				
Never	Reference		Reference	
Less than monthly	1.15	0.93 – 1.42	1.72	1.14 – 2.60
Monthly	1.34	0.86 – 2.10	2.26	1.16 – 4.43
Weekly or daily	1.73	1.04 – 2.90	2.38	1.21 – 4.71

OR, odds ratio; CI, confidence interval.

Poor mental well-being based on cut-off for WHO-5 Well-being Index of <50 points.

Model 1: Crude model.

Model 2: Adjusted for age, sex, nationality, place of residence, educational attainment, net income, type of position, type of employer, weighting for non-response.

Model 3: Adjusted for age, sex, nationality, place of residence, educational attainment, net income, type of position, type of employer, time pressure, autonomy, social support, quality of employment, weighting for non-response.

Model 4: Adjusted for age, sex, nationality, place of residence, educational attainment, net income, type of position, type of employer, time pressure, autonomy, social support, quality of employment, workplace bullying, weighting for non-response.

4. Discussion

We aimed to examine the hypothesised dose-response relationship between workplace discrimination and adverse mental health outcomes. Particularly, we estimated the associations of frequency and number of types of discrimination at work with poor mental well-being and suicidal ideation using cross-sectional data from a survey among more than 2500 individuals working in Luxembourg. Altogether, our analyses yielded strong evidence for an association between workplace discrimination and suicidal ideation including indication for a dose-response relationship. Moreover, we observed good evidence for an association of workplace discrimination with symptoms of poor mental well-being, also with increasing odds of the outcome from the lowest to the highest exposure categories.

This evidence is strengthened by the fact that also after adjustment for several sociodemographic and job-related factors (Model 2) as well as psychosocial conditions (Model 3) almost all Odds Ratios remained statistically significant. In the fully adjusted model that additionally accounted for potential confounding by bullying (Model 4), the evidence (particularly for depression) became weaker and Odds Ratios somewhat diminished. While we consider it worthwhile to account for bullying as a potential confounder (as outlined in the introduction), we acknowledge that this analytical approach may be regarded as debatable because of the possible correlation of bullying (and possibly also social support) with discrimination. Under this assumption, one could argue that the

Table 3

Results from the logistic regression models estimating the association of number of types of workplace discrimination with poor mental well-being (H2a) and suicidal ideation (H2b).

	Poor mental well-being		Suicidal ideation	
	OR	95% CI	OR	95% CI
Model 1				
Number of types of discrimination				
0	Reference		Reference	
1	1.79	1.44 – 2.23	2.03	1.30 – 3.16
2	2.14	1.61 – 2.85	2.59	1.54 – 4.36
3	3.68	2.44 – 5.56	3.63	1.93 – 6.82
4 or more	3.98	2.69 – 5.89	4.52	2.59 – 7.91
Model 2				
Number of types of discrimination				
0	Reference		Reference	
1	1.70	1.36 – 2.13	2.18	1.38 – 3.46
2	2.01	1.50 – 2.69	2.83	1.65 – 4.83
3	3.61	2.34 – 5.53	4.26	2.23 – 8.12
4 or more	3.66	2.46 – 5.46	4.31	2.40 – 7.74
Model 3				
Number of types of discrimination				
0	Reference		Reference	
1	1.33	1.04 – 1.69	1.88	1.17 – 3.00
2	1.20	0.87 – 1.65	1.97	1.12 – 3.47
3	2.09	1.32 – 3.32	2.84	1.45 – 5.56
4 or more	1.91	1.24 – 2.93	2.69	1.45 – 4.99
Model 4				
Number of types of discrimination				
0	Reference		Reference	
1	1.21	0.95 – 1.55	1.75	1.09 – 2.81
2	0.97	0.69 – 1.35	1.65	0.92 – 2.95
3	1.65	1.02 – 2.66	2.33	1.17 – 4.64
4 or more	1.41	0.91 – 2.20	2.19	1.16 – 4.13

OR, odds ratio; CI, confidence interval.

Model 1: Crude model.

Model 2: Adjusted for age, sex, nationality, place of residence, educational attainment, net income, type of position, type of employer, weighting for non-response.

Model 3: Adjusted for age, sex, nationality, place of residence, educational attainment, net income, type of position, type of employer, time pressure, autonomy, social support, quality of employment, weighting for non-response.

Model 4: Adjusted for age, sex, nationality, place of residence, educational attainment, net income, type of position, type of employer, time pressure, autonomy, social support, quality of employment, workplace bullying, weighting for non-response.

ORs in Model 3 and 4 are over-adjusted and biased towards 1.0, thereby underestimating the true association between discrimination and depression/suicidal ideation. On the other hand, it could also be interpreted as that even these possibly over-adjusted effect measures still at least partially imply an association, especially for suicidal ideation. Therefore, altogether we interpret our models as providing noteworthy evidence for an association of workplace discrimination with both outcomes. In very broad terms, these findings underline the notion that the (psychosocial) working environment is a major social determinant of health (Frank et al., 2023; Shields et al., 2021). More specifically, our results are in line with the results of other studies investigating the potential association between exposure to discrimination at work with mental health and well-being, including prospective studies (Chu, 2024; Clausen et al., 2022; Di Napoli et al., 2021; Han et al., 2022; Keller et al., 2024). Most recently, a study among Indigenous and racially framed individuals in Canada observed elevated odds of depression and other mental health outcomes in association with exposure to (racial) discrimination at work (Dalexis et al., 2026). Our results also confirm the results of a study analysing data from 21 European countries that reported an increased risk of depressive disorders in relation to multiple discrimination, even though this study not specifically referred to discrimination at the workplace (Alvarez-Galvez and Rojas-Garcia, 2019). Furthermore, there is prospective evidence from a cohort study

observing an association between labour market discrimination and suicidal ideation (Chu, 2024). Our study expands the existing literature by providing data on the potential dose-response relationship between frequency and number of types of workplace discrimination and impaired mental well-being.

With almost 40% of the participants falling under the threshold for poor mental well-being, our results imply a notable level of impaired well-being in our study population. These numbers may reflect the sharply growing burden of mental illness observed globally and confirm that there is an urgent need for targeted prevention and intervention strategies, also in occupational settings (Zhang et al., 2026; Rugulies et al., 2023). As data collection was done during the COVID pandemic, our results could also be interpreted as further underlining the association between the pandemic and individuals' mental health. In fact, a study among Luxembourgian residents estimated that on in three residents observed that one in three residents reported that their mental health deteriorated during the pandemic (O'Connor and Peroni, 2020). A meta-analysis revealed a global prevalence for suicidal ideation of 13.5% among the general population during COVID (Mudiyansele et al., 2025). The prevalences in our study population hence do not appear entirely implausible. At the same time, we cannot rule out that individuals working under poorer working conditions may have had a higher likelihood to participate in a survey focusing on working conditions than individuals who are very satisfied with their work situations. This could have led our results to overestimate the true prevalence of mental health impairment in the Luxembourgian workforce. Having said that, there is little indication to assume considerable selection bias with respect to socio-demographic characteristics, even though the response rate was very low (Schütz and Thiele, 2021).

Moreover, readers should keep in mind several other caveats when interpreting our findings. These include Luxembourg being among the countries with the highest income levels worldwide, a fact that is reflected in the high average income reported by our participants. Another rather unique characteristic of our study population is the large proportion of commuters from neighbouring countries which may explain why experiencing discrimination because of nationality was among the most frequently reported types of discrimination. Additionally, about half of our participants held a university degree and almost all of them had a permanent working contract. Despite the high socio-economic level of many participants, a considerable proportion of our study population reported at least occasional exposure to workplace discrimination during the last year. This observation appears less surprising though taking into account that the European Labour Force Survey, conducted also in 2021, reported that Luxembourg had the highest prevalence of workplace discrimination across all EU member states (Eurostat, 2022).

Furthermore, assessing both exposure and outcome via the same method (phone interviews), could potentially have opened the door for common method bias (Podsakoff et al., 2003). For example, a certain number of participants with a tendency towards overstating their answers could have biased our results towards an overestimation of workplace discrimination and mental health impairment among the participants. Furthermore, the low response rate (14%) may have opened the door for selection bias. We tried to mitigate this by including non-response weights. Interestingly, the models with and without non-response weights differed very little from each other suggesting that selection bias had a limited impact on our results despite the low response rate. Nonetheless, it should be kept in mind that also such a weighting approach cannot fully preclude any form of bias resulting from selective non-participation. In addition, our models yielded less evidence when using the lower WHO-5 Well-being Index cut-off (≤ 28 points) and concrete suicide plans (yes vs. no) as outcomes variables which could at least partly be explained by the smaller number of cases in these models.

Despite adjusting our models for a range of sociodemographic and employment characteristics as well as psychosocial confounders, we

cannot rule out that our results may be distorted by uncontrolled confounding from other factors on which we had no information. These include participants' experiences of discrimination in non-work environments, e.g. when renting an apartment or seeking medical care (Williams et al., 2019), and their medical history, particularly with respect to mental health. A related limitation is that even though the data stem from a longitudinal study, the survey focuses primarily on aspects of work design and assessed exposure to workplace discrimination only once (in the 2021 wave). Moreover, most participants of the 2021 wave had not participated in the previous waves since they were part of the refreshment sample. Hence, for the present research question we could not make use of the longitudinal data but had to confine the analysis to a cross-sectional approach. This cross-sectional design did not allow to establish a temporal relationship between exposure and outcomes so that we cannot preclude reverse causation. For example, we cannot fully preclude that some individuals with poor mental well-being could have overly reported the frequency of being discriminated against because of some form of negative bias in interpreting social interactions, which is a frequent symptom of depression (Everaert et al., 2017). However, given the mechanistic plausibility of an association between discrimination and mental ill-health outlined in the introduction as well as the above-mentioned prospective studies reporting similar results to ours, it appears unlikely that our findings are primarily grounded in reverse causality or reporting bias. Nonetheless, confirmation by further longitudinal studies is desirable.

Another intriguing aspect for further academic debate and research resulting from our findings could be the aim to further disentangle the relationship between workplace discrimination and workplace bullying. On the one hand, we observed a notable degree of confounding by workplace bullying. On the other hand, adjusting for workplace bullying did not fully eliminate the association between workplace discrimination and poor mental health. Besides, bullying was moderately, but not strongly correlated to frequency of discrimination and the number of types for discrimination. Altogether, these results may be interpreted as indication that discrimination and bullying are two related and overlapping but not identical forms of oppression/injustice/threat at work with minoritised groups being particularly at risk of both of them (Okechukwu et al., 2014; Rosander et al., 2025). Differences include the fact that bullying does not necessarily need to be related to the victim's social identity. Furthermore, bullying is defined to occur via repeated, systematic actions while discrimination does not need to be performed systematically (Rosander et al., 2025). An interesting question in this context could be to what extent workplace bullying could be motivated by the fact that the victim belongs to a minoritised group (Rosander et al., 2025). Likewise, future research could explore if bullying, at least in some cases, may be selectively targeted at individuals from marginalised groups as it has been observed for workplace incivility (Cortina et al., 2013).

Additionally, we also observed a notable degree of influence exerted by psychosocial working conditions other than bullying (Model 2 vs. Model 3) which seems to be in line with a Spanish meta-analysis showing that organisational/work design factors are relevant antecedents of bullying (Cantisano et al., 2007). Whether good psychosocial work design also has a preventive effect against workplace discrimination would also be a worthwhile area for future research, as called for by Frank et al. (2023).

In terms of practical implications, some researchers are arguing that diversion, equity and inclusion in the workplace may be important means of keeping a healthy and productive workforce as well as protecting occupational and public health (Abubakar et al., 2022; Cancela et al., 2025; Maletta et al., 2024; Mosley et al., 2025). Concrete measures in this context that are discussed in the literature include educational and awareness campaigns (Zajdel et al., 2025), possibly as early as during professional education (Jellins et al., 2024), as well as anti-discrimination and inclusive policies at organisational level (Cancela et al., 2025). At individual level, a systematic review suggested

that employees vulnerable to stigmatisation and discrimination because of their social identity may benefit from support by supervisors and co-workers (Cancela et al., 2025). Furthermore, a recent meta-analysis evaluating the effectiveness of interventions to reduce discrimination at work identified measures directly targeting discriminatory behaviours, e.g., by making individuals accountable for their behaviour, as most promising (Costa, 2024).

5. Conclusion

Even though the design of our analysis does not allow causal conclusions, its results points towards a dose-response relationship between workplace discrimination and poor mental well-being as well as suicidal ideation. Overall, these findings provide further support for the view that discrimination in the workplace may be regarded as a serious public health issue.

CRedit authorship contribution statement

Tobias Weinmann: Writing – original draft, Formal analysis, Conceptualization. **Britta Herbig:** Writing – review & editing, Formal analysis, Conceptualization. **Philipp Sischka:** Writing – review & editing, Resources, Formal analysis, Data curation, Conceptualization.

Ethics

The data stem from a long-term research project initiated in 2013. The present analyses draw on data collected in the 2021 wave of this project. Under the ethics governance procedures in place at the time the project was initiated (2013), studies involving non-clinically relevant questionnaires on everyday experiences and behaviors were exempt from formal ethical review. Nevertheless, the study was conducted in accordance with established ethical standards, including the Declaration of Helsinki. Participation was voluntary, respondents could withdraw their consent at any time during the interview without negative consequences, and informed consent was obtained from all participants prior to participation after they had been informed about the aims and content of the study.

Declaration of competing interest

The authors declare no competing interests.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.socscimed.2026.119869>.

Data availability

Data will be made available on request.

References

- Abrutyn, S., Mueller, A.S., 2018. Toward a cultural-structural theory of suicide: examining excessive regulation and its discontents. *Sociol. Theor.* 36, 48–66. <https://doi.org/10.1177/0735275118759150>.
- Abubakar, I., Gram, L., Lasoye, S., Achiume, E.T., Becares, L., Bola, G.K., et al., 2022. Confronting the consequences of racism, xenophobia, and discrimination on health and health-care systems. *Lancet* 400, 2137–2146. [https://doi.org/10.1016/S0140-6736\(22\)01989-4](https://doi.org/10.1016/S0140-6736(22)01989-4).
- Alvarez-Galvez, J., Rojas-García, A., 2019. Measuring the impact of multiple discrimination on depression in Europe. *BMC Public Health* 19, 435. <https://doi.org/10.1186/s12889-019-6714-4>.
- Baek, S.U., Yoon, J.H., Won, J.U., 2025. Gender discrimination in the workplace and the onset of problematic alcohol use among female wage workers: a longitudinal study in Korea. *Soc. Sci. Med.* 379, 118183. <https://doi.org/10.1016/j.socscimed.2025.118183>.
- Berjot, S., Gillet, N., 2011. Stress and coping with discrimination and stigmatization. *Front. Psychol.* 2, 33. <https://doi.org/10.3389/fpsyg.2011.00033>.
- Boot, C.R.L., LaMontagne, A.D., Madsen, I.E.H., 2024. Fifty years of research on psychosocial working conditions and health: from promise to practice. *Scand J Work Environ Health* 50 (6), 395–405. <https://doi.org/10.5271/sjweh.4180>.
- Cancela, D., Stutterheim, S.E., Uitdewilligen, S., 2025. The workplace experiences of transgender and gender diverse employees: a systematic literature review using the minority stress model. *J. Homosex.* 72, 60–88. <https://doi.org/10.1080/00918369.2024.2304053>.
- Cantisano, G.T., Depolo, M., Domínguez, J.F.M., 2007. Acoso laboral: Meta-análisis y modelo integrador de sus antecedentes y consecuencias. [Mobbing: a meta-analysis and integrative model of its antecedents and consequences. *Psicothema* 19, 88–94.
- Central Statistics Office, 2025. Equality and Discrimination 2024. Key Findings. <https://www.cso.ie/en/releasesandpublications/ep/p-ed/equalityanddiscrimination2024/keyfindings/>. (Accessed 26 July 2026).
- Chu, Y., 2024. Labor market discrimination and suicidal ideation: a longitudinal study of Korean women. *Soc. Sci. Med.* 354, 117080. <https://doi.org/10.1016/j.socscimed.2024.117080>.
- Clausen, T., Rugulies, R., Li, J., 2022. Workplace discrimination and onset of depressive disorders in the Danish workforce: a prospective study. *J. Affect. Disord.* 319, 79–82. <https://doi.org/10.1016/j.jad.2022.09.036>.
- Coates, M.M., Arah, O.A., Matthews, T.A., Sandler, D.P., Jackson, C.L., Li, J., 2024. Multiple forms of perceived job discrimination and hypertension risk among employed women: findings from the Sister Study. *Am. J. Ind. Med.* 67, 844–856. <https://doi.org/10.1002/ajim.23634>.
- Conway, P.M., Erlangsen, A., Grynderup, M.B., Clausen, T., Björner, J.B., Burr, H., et al., 2025. Self-reported workplace bullying and subsequent risk of diagnosed mental disorders and psychotropic drug prescriptions: a register-based prospective cohort study of 75,252 participants. *J. Affect. Disord.* 369, 1–7. <https://doi.org/10.1016/j.jad.2024.09.134>.
- Conway, P.M., Erlangsen, A., Grynderup, M.B., Clausen, T., Rugulies, R., Björner, J.B., Burr, H., et al., 2022. Workplace bullying and risk of suicide and suicide attempts: a register-based prospective cohort study of 98 330 participants in Denmark. *Scand. J. Work. Environ. Health* 48 (6), 425–434. <https://doi.org/10.5271/sjweh.4034>.
- Cortina, L.M., Kabat-Farr, D., Leskinen, E.A., Huerta, M., Magley, V.J., 2013. Selective incivility as modern discrimination in organizations: evidence and impact. *J. Manag.* 39, 1579–1605. <https://doi.org/10.1177/0149206311418835>.
- Costa, E., 2024. Examining the effectiveness of interventions to reduce discriminatory behavior at work: an attitude dimension consistency perspective. *J. Appl. Psychol.* 109, 1669–1692. <https://doi.org/10.1037/apl0001215>.
- Dalexis, R.D., Farahi, S., Pakhalé, S., Cénat, J.M., Bourgeault, I.L., 2026. Workplace racial discrimination as a major public health threat: association with depression, anxiety, stress and PTSD symptoms among racialized and Indigenous peoples in Canada. *Psychiatry Res.* 356, 116905. <https://doi.org/10.1016/j.psychres.2025.116905>.
- Demerouti, E., Bakker, A.B., Nachreiner, F., Schaufeli, W.B., 2001. The job demands-resources model of burnout. *J. Appl. Psychol.* 86 (3), 499–512.
- Dhanani, L.Y., Beus, J.M., Joseph, D.L., 2018. Workplace discrimination: a meta-analytic extension, critique, and future research agenda. *Pers. Psychol.* 71, 147–179. <https://doi.org/10.1111/peps.12254>.
- Di Napoli, A., Rossi, A., Baralla, F., Ventura, M., Gatta, R., Perez, M., et al., 2021. Self-perceived workplace discrimination and mental health among immigrant workers in Italy: a cross-sectional study. *BMC Psychiatry* 21, 85. <https://doi.org/10.1186/s12888-021-03077-6>.
- European Agency for Safety and Health at Work, 2022. Discrimination in the workplace. <https://oshwiki.osha.europa.eu/en/themes/discrimination-workplace>. (Accessed 17 March 2026).
- European Commission: Directorate-General for Employment, Social Affairs and Inclusion, 2007. Tackling Multiple Discrimination – Practices, Policies and Laws. Publications Office of the European Union. <https://op.europa.eu/en/publication-detail/-/publication/flf6da3a-2c36-4ef7-a7c2-b906349220b4>. (Accessed 17 March 2026).
- Eurostat, 2022. Self-perceived discrimination at work - statistics. https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Self-perceived_discrimination_at_work_statistics. (Accessed 17 March 2026).
- Everaert, J., Podina, I.R., Koster, E.H.W., 2017. A comprehensive meta-analysis of interpretation biases in depression. *Clin. Psychol. Rev.* 58, 33–48. <https://doi.org/10.1016/j.cpr.2017.09.005>.
- Frank, J., Mustard, C., Smith, P., Siddiqi, A., Cheng, Y., Burdorf, A., et al., 2023. Work as a social determinant of health in high-income countries: past, present, and future. *Lancet* 402, 1357–1367. [https://doi.org/10.1016/S0140-6736\(23\)00871-1](https://doi.org/10.1016/S0140-6736(23)00871-1).
- Goosby, B.J., Cheadle, J.E., Mitchell, C., 2018. Stress-related biosocial mechanisms of discrimination and African American health inequities. *Annu. Rev. Sociol.* 44, 319–340. <https://doi.org/10.1146/annurev-soc-060116-053403>.
- Gou, Y., Cheng, S., Kang, M., Zhou, R., Liu, C., Hui, J., et al., 2025. Association of allostatic load with depression, anxiety, and suicide: a prospective cohort study. *Biol. Psychiatry* 97, 786–793. <https://doi.org/10.1016/j.biopsych.2024.09.026>.
- Hammond, W.P., Gillen, M., Yen, I.H., 2010. Workplace discrimination and depressive symptoms: a study of multi-ethnic hospital employees. *Race Soc Probl* 2, 19–30. <https://doi.org/10.1007/s12552-010-9024-0>.
- Han, X., Mortimer, J., VanHeuvelen, T., 2022. Perceived discrimination in the workplace and mental health from early adulthood to midlife. *Longit Life Course Stud* 14, 22–47. <https://doi.org/10.1332/175795921x16615892091105>.
- Hara, A.S., 2025. Racial microaggressions as perceived chronic stressors: self-reported physiological symptoms, mental health outcomes, and occupational wellbeing in Malawian workplaces. *Front. Public Health* 13, 1687025. <https://doi.org/10.3389/fpubh.2025.1687025>.
- Hazelzet, E., Houkes, I., Bosma, H., de Rijak, A., 2022. How a steeper organisational hierarchy prevents change—adoption and implementation of a sustainable employability intervention for employees in low-skilled jobs: a qualitative study. *BMC Public Health* 22, 2373. <https://doi.org/10.1186/s12889-022-14754-w>.
- Jellins, T.S., Borko, T.L., Otero-Bell, R., Arnett, K., Saunders, S., Poisson, S.N., et al., 2024. Diversity, equity, and inclusion (DEI) in medical education: DEI at the bedside. *J. Neurol. Sci.* 459, 122946. <https://doi.org/10.1016/j.jns.2024.122946>.
- Keller, E., Guardiano, M., Li, J., 2024. Discrimination in the workplace linked to psychological distress: a longitudinal Study in the United States. *J. Occup. Environ. Med.* 66, 803–809. <https://doi.org/10.1097/jom.0000000000003175>.
- Kim, S., Won, E., Jeong, H.-G., Lee, M.-S., Ko, Y.-H., Paik, J.-W., et al., 2022. Gender discrimination in workplace and depressive symptoms in female employees in South Korea. *J. Affect. Disord.* 306, 269–275. <https://doi.org/10.1016/j.jad.2022.03.050>.
- Laferton, J.A.C., Bartsch, L.M., Möschinger, T., Baldelli, L., Frick, S., Breitenstein, C.J., et al., 2023. Effects of stress beliefs on the emotional and biological response to acute psychosocial stress in healthy men. *Psychoneuroendocrinology* 152, 106091. <https://doi.org/10.1016/j.psyneuen.2023.106091>.
- Lazarus, R.S., Folkman, S., 1984. Stress, Appraisal, and Coping. Springer Publishing Company.
- Li, Y., Yan, J., Li, Y., 2024. Association between allostatic load and depression in patients with sleep disorders: evidence from the national health and nutrition examination survey (NHANES). *Int J Psychiatry Med* 59, 670–684. <https://doi.org/10.1177/00912174241244479>.
- Llora, J.A., Agulló-Tomás, E., Menéndez-Espina, S., Oliveros, B., 2023. Revisiting the work-suicide link: renewed evidence and models of analysis in workplace contexts. *Front. Psychol.* 14, 1290079. <https://doi.org/10.3389/fpsyg.2023.1290079>.
- Magnusson Hanson, L.L., Nyberg, A., Mittendorfer-Rutz, E., Bondestam, F., Madsen, I.E.H., 2020. Work related sexual harassment and risk of suicide and suicide attempts: prospective cohort study. *BMJ* 370, m2984.
- Magnusson Hanson, L.L., Pentti, J., Nordentoft, M., Xu, T., Rugulies, R., Madsen, I.E.H., Conway, P.M., et al., 2023. Association of workplace violence and bullying with later suicide risk: a multicohort study and meta-analysis of published data. *Lancet Public Health* 8 (7), e494–e503. [https://doi.org/10.1016/S2468-2667\(23\)00096-8](https://doi.org/10.1016/S2468-2667(23)00096-8).
- Maletta, R.M., Daly, M., Goodwin, L., Noonan, R., Putra, I., Robinson, E., 2024. Changes in the prevalence of perceived discrimination and associations with probable mental health problems in the UK from 2015 to 2020: a repeated cross-sectional analysis of the UK household longitudinal study. *SSM Popul. Health* 26, 101667. <https://doi.org/10.1016/j.ssmph.2024.101667>.
- Marchiondo, L.A., Gonzales, E., Williams, L.J., 2019. Trajectories of perceived workplace age discrimination and long-term associations with mental, self-rated, and occupational health. *J. Gerontol. B Psychol. Sci. Soc. Sci.* 74, 655–663. <https://doi.org/10.1093/geronb/gbx095>.
- Matthiesen, S.B., Einarsen, S., 2010. Bullying in the workplace: definition, prevalence, antecedents and consequences. *Int J Organ Theory Behav* 13, 202–248. <https://doi.org/10.1108/IJOTB-13-02-2010-B004>.
- Mauss, D., Li, J., Schmidt, B., Angerer, P., Jarczok, M.N., 2015. Measuring allostatic load in the workforce: a systematic review. *Ind. Health* 53, 5–20. <https://doi.org/10.2486/indhealth.2014-0122>.
- McEwen, B.S., 1998. Protective and damaging effects of stress mediators. *N. Engl. J. Med.* 338, 171–179. <https://doi.org/10.1056/NEJM199801153380307>.
- McEwen, B.S., 2000. Allostasis and allostatic load: implications for neuropsychopharmacology. *Neuropsychopharmacology* 22, 108–124. [https://doi.org/10.1016/S0893-133X\(99\)00129-3](https://doi.org/10.1016/S0893-133X(99)00129-3).
- McKee, M., Figueras, J., Kalediene, R., Joshi, A., El-Mohandes, A., Otok, R., et al., 2025. An agenda for public health diplomacy in an Age of populism. *Public Health Rev.* 46, 1609089. <https://doi.org/10.3389/phrs.2025.1609089>.
- Milner, A., Witt, K., LaMontagne, A.D., Niedhammer, I., 2018. Psychosocial job stressors and suicidality: a meta-analysis and systematic review. *Occup. Environ. Med.* 75, 245–253. <https://doi.org/10.1136/oemed-2017-104531>.
- Mosley, T.J., Zajdel, R.A., Alderete, E., Clayton, J.A., Heidari, S., Pérez-Stable, E.J., et al., 2025. Intersectionality and diversity, equity, and inclusion in the healthcare and scientific workforces. *Lancet Reg. Health, Am.* 41, 100973. <https://doi.org/10.1016/j.lana.2024.100973>.
- Mudiyanselage, S.P.K., Tsai, Y.T., Dilhani, M.S., Tsai, Y.J., Yang, Y.H., Lu, Z.T., Ko, N.Y., 2025. Global overview of suicidal behavior and risk factors among general population during the COVID-19 pandemic: a systematic review and a meta-regression. *Psychiatr. Q.* 96 (2), 381–444.

- Nam, S., Jeon, S., Lee, S.J., Ash, G., Nelson, L.E., Granger, D.A., 2022. Real-time racial discrimination, affective states, salivary cortisol and alpha-amylase in Black adults. *PLoS One* 17, e0273081. <https://doi.org/10.1371/journal.pone.0273081>.
- Ng, E., Fitzsimmons, T., Kulkarni, M., Ozturk, M.B., April, K., Banerjee, R., et al., 2025. The anti-DEI agenda: navigating the impact of Trump's second term on diversity, equity and inclusion. *Equal. Divers. Incl.* 44, 137–150. <https://doi.org/10.1108/EDI-02-2025-0116>.
- Nielsen, M., Einarsen, S., 2012. Outcomes of exposure to workplace bullying: a meta-analytic review. *Work. Stress* 26. <https://doi.org/10.1080/02678373.2012.734709>.
- O'Connor, K.J., Peroni, C., 2020. One in three Luxembourg residents report their mental health declined during the COVID-19 crisis. *Int J Community Wellbeing* 4 (3), 345–351. <https://doi.org/10.1007/s42413-020-00093-4>.
- Okechukwu, C.A., Souza, K., Davis, K.D., de Castro, A.B., 2014. Discrimination, harassment, abuse, and bullying in the workplace: contribution of workplace injustice to occupational health disparities. *Am. J. Ind. Med.* 57, 573–586. <https://doi.org/10.1002/ajim.22221>.
- Podsakoff, P.M., MacKenzie, S.B., Lee, J.Y., Podsakoff, N.P., 2003. Common method biases in behavioral research: a critical review of the literature and recommended remedies. *J. Appl. Psychol.* 88, 879–903. <https://doi.org/10.1037/0021-9010.88.5.879>.
- Rosander, M., Hoel, H., Blomberg, S., 2025. Protected grounds of discrimination and the risk of workplace bullying. *Front. Psychol.* 16, 1488010. <https://doi.org/10.3389/fpsyg.2025.1488010>.
- Rugulies, R., Aust, B., Greiner, B.A., Arensman, E., Kawakami, N., LaMontagne, A.D., Madsen, I.E.H., 2023. Work-related causes of mental health conditions and interventions for their improvement in workplaces. *Lancet* 402 (10410), 1368–1381. [https://doi.org/10.1016/S0140-6736\(23\)00869-3](https://doi.org/10.1016/S0140-6736(23)00869-3).
- Schütz, H., Thiele, N., 2021. Quality of Work Luxembourg 2021. Bericht. Bonn: Infas.
- Seery, M.D., 2011. Challenge or threat? Cardiovascular indexes of resilience and vulnerability to potential stress in humans. *Neurosci. Biobehav. Rev.* 35, 1603–1610. <https://doi.org/10.1016/j.neubiorev.2011.03.003>.
- Semmer, N.K., Tschann, F., Jacobshagen, N., Beehr, T.A., Elfering, A., Kälén, W., Meier, L., 2019. Stress as offense to self: a promising approach comes of Age. *Occup Health Sci* 3 (3), 205–238. <https://doi.org/10.1007/s41542-019-00041-5>.
- Shields, M., Dimov, S., Kavanagh, A., Milner, A., Spittal, M.J., King, T.L., 2021. How do employment conditions and psychosocial workplace exposures impact the mental health of young workers? A systematic review. *Soc Psychiatry Psychiatr Epidemiol* 56, 1147–1160. <https://doi.org/10.1007/s00127-021-02077-x>.
- Sischa, P.E., Costa, A.P., Steffgen, G., Schmidt, A.F., 2020. The WHO-5 well-being index – validation based on item response theory and the analysis of measurement invariance across 35 countries. *J Affect Disord Rep* 1, 100020. <https://doi.org/10.1016/j.jadr.2020.100020>.
- Sischa, P.E., Melzer, A., Schmidt, A.F., Steffgen, G., 2021. Psychological contract violation or basic need frustration? Psychological mechanisms behind the effects of workplace bullying. *Front. Psychol.* 12, 627968. <https://doi.org/10.3389/fpsyg.2021.627968>.
- Speed, E., Mannion, R., 2020. Populism and health policy: three international case studies of right-wing populist policy frames. *Social Health Illn* 42, 1967–1981. <https://doi.org/10.1111/1467-9566.13173>.
- Steffgen, G., Sischa, P., Schmidt, A., Kohl, D., Happ, C., 2016. The Luxembourg workplace mobbing Scale. *Eur. J. Psychol. Assess.* 35, 164–171. <https://doi.org/10.1027/1015-5759/a000381>.
- Steffgen, G., Sischa, P.E., Fernandez de Henestrosa, M., 2020. The quality of work index and the quality of employment index: a multidimensional approach of job quality and its links to well-being at work. *Int J Environ Res Public Health* 17. <https://doi.org/10.3390/ijerph17217771>.
- Topp, C.W., Østergaard, S.D., Søndergaard, S., Bech, P., 2015. The WHO-5 well-being index: a systematic review of the literature. *Psychother. Psychosom.* 84, 167–176. <https://doi.org/10.1159/000376585>.
- Vinluan, A.C., Smith, A.L., Chang, E.H., Kirgios, E.L., 2025. Structured evaluation processes are associated with higher levels of employee belonging. *Sci. Rep.* 15 (1), 13289. <https://doi.org/10.1038/s41598-025-97901-8>.
- Vonderlin, R., Schmidt, B., Müller, G., Biermann, M., Kleindienst, N., Bohus, M., Lyssenko, L., 2021. Health-Oriented leadership and mental health from supervisor and employee perspectives: a multilevel and multisource approach. *Front. Psychol.* 11, 614803. <https://doi.org/10.3389/fpsyg.2020.614803>.
- Williams, D.R., Lawrence, J.A., Davis, B.A., Vu, C., 2019. Understanding how discrimination can affect health. *Health Serv. Res.* 54 (Suppl. 2), 1374–1388. <https://doi.org/10.1111/1475-6773.13222>.
- Zajdel, R.A., Rodriguez, E.J., Mejía, R., Pérez-Stable, E.J., 2025. Perspectives on the intersection of race and ethnicity, immigration status, and sexual and gender minoritised status among clinical and scientific workforces in Latin America. *Lancet Reg. Health Am.* 41, 100975. <https://doi.org/10.1016/j.lana.2024.100975>.
- Zhang, X., Zhang, W., Zhou, C., Xiang, J., Xu, Z., Wang, Y., Hou, X., Wang, J., Yue, S., Chen, X., Wu, J., 2026. Global, regional, and national burden of mental disorders in working-age population: a trend, health inequality, and frontier analyses. *J. Affect. Disord.* 393 (Pt A), 120367. <https://doi.org/10.1016/j.jad.2025.120367>.