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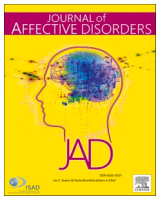

Research paper

Discrimination and the risk of depression among university students: A national longitudinal study using diagnostic data

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ABSTRACT

Objective: Discrimination is increasingly recognized as a key risk factor for student mental health. However, few longitudinal studies have assessed its association with clinically defined depression using standardized diagnostic tools. This study examines whether self-reported experiences of discrimination are associated with an increased risk of major depressive episode (MDE) one year later among higher education students.
Participants: A subsample of 7884 university and college students (ages 18–35) from the national Norwegian SHoT2022 survey who completed a self-administered follow-up diagnostic interview one year later.
Methods: Discrimination was assessed at baseline across ten domains (e.g., ethnicity, gender, sexual orientation, political opinion). Current MDE was assessed using the electronic version of the Composite International Diagnostic Interview (CIDI 5.0). Poisson regression with robust standard errors was used to estimate relative risks (RRs), adjusting for age, sex, and baseline psychological distress.
Results: Discrimination was commonly reported, with gender-based discrimination most prevalent among women and political discrimination among men. Exposure to any discrimination was associated with an elevated risk of MDE (RRs ranging from 1.3 to 2.9), with sexual orientation- and gender identity-based discrimination showing the strongest effects. A clear dose-response relationship was observed: students reporting four or more types of discrimination had a nearly fourfold risk of MDE compared to those reporting none. Associations were generally similar across sexes.
Conclusions: Discrimination is a robust and graded predictor of depression among students in higher education. Findings underscore the need for inclusive mental health services and institutional efforts to prevent and address discrimination on campuses.

1. Introduction

Discrimination defined as unfair or prejudicial treatment based on personal characteristics such as ethnicity, gender, disability, or sexual orientation, is increasingly recognized as a significant determinant of health and wellbeing (Krieger, 2014). A growing body of research consistently links such experiences to a range of adverse mental and physical health outcomes, including depression, anxiety, sleep disturbances, and suicidal ideation (Pascoe and Smart, 2009; Williams and Mohammed, 2009). These associations underscore discrimination not only as a social justice issue, but also as a public health concern (Williams et al., 2008).

Although discrimination can affect individuals across diverse demographic groups, young adults may be especially vulnerable due to their developmental stage and social environment (Lei et al., 2021; Priest et al., 2013). The transition from adolescence to adulthood is marked by identity exploration, shifting social roles, and exposure to new contexts, such as higher education institutions (Zarrett and Eccles, 2006). University students, in particular, often face academic demands, relocation, and disruptions in social support, all of which may heighten their sensitivity to discrimination. Moreover, identity dimensions frequently targeted by discrimination (e.g., gender identity, sexual orientation, race/ethnicity) often emerge or solidify during this life stage, further amplifying psychological vulnerability (Ghavami et al.,

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2016).

While the mental health consequences of discrimination have been documented in general populations, research specifically targeting college and university students remains limited (Qeadan et al., 2022). Emerging evidence indicates that discriminatory experiences are relatively common in university settings and may contribute to increased psychological distress and poorer academic outcomes (Qeadan et al., 2022; Mayo Bs and Le Ph, 2023). However, most existing studies are cross-sectional or based on brief symptom scales, limiting insight into whether discrimination prospectively predicts clinically diagnosed mental disorders.

Depression is of particular concern, as it remains one of the most prevalent and disabling mental health conditions worldwide (Mathers and Loncar, 2006; Collaborators, 2022), and appears to be especially sensitive to the effects of discrimination compared to other disorders (Vargas et al., 2020). Longitudinal studies in general populations suggest that perceived discrimination is a significant predictor of depression (Hudson et al., 2013), even when accounting for baseline symptoms (Gayman and Barragan, 2013). A dose-response relationship has also been proposed, whereby exposure to multiple forms of discrimination confers a greater risk of depressive outcomes (Gayman and Barragan, 2013; Denise, 2012).

Despite these insights, few studies have employed standardized diagnostic tools to examine the relationship between discrimination and subsequent depression. Much of the existing literature relies on brief symptom checklists, rather than validated diagnostic interviews, which limits the clinical interpretability of findings. Instruments such as the Composite International Diagnostic Interview (CIDI) (Kessler and Ustun, 2004), allow for standardized, criterion-based assessment and improve comparability across studies and populations.

There is also a lack of research comparing the mental health effects of different discrimination types, including those based on ethnicity, religion, gender identity, sexual orientation, disability, and political beliefs. Prior work suggests that certain forms of discrimination, especially those related to race/ethnicity and sexual orientation, may be particularly detrimental (Denise, 2012). Moreover, it remains unclear whether exposure to multiple types of discrimination has a cumulative or synergistic effect on mental health. Large, population-based studies that assess multiple discrimination domains concurrently are needed to address these questions.

Sex differences add further complexity. Females are more likely to report certain types of discrimination (e.g., gender-based harassment) (Sivertsen et al., 2019a) and have higher overall rates of depression (Sivertsen et al., 2023), while males may underreport emotional difficulties due to stigma or gender norms, potentially concealing important associations (Brown et al., 2022; Smith et al., 2018). Whether the association between discrimination and depression varies by sex in student populations remains insufficiently explored.

In summary, there is a critical need for longitudinal studies that use structured diagnostic tools to investigate the relationship between discrimination and depression in student populations. This study addresses that gap using prospective data from SHoT2022, a national survey of higher education students in Norway, combined with follow-up diagnostic interviews conducted one year later using the CIDI 5.0. Specifically, we assess whether self-reported experiences of discrimination are associated with increased risk of major depressive episode (MDE), whether these associations differ by sex, and how exposure to multiple discrimination types influences risk. Importantly, we adjust for baseline psychological distress measured at the time of exposure, allowing us to more rigorously examine the prospective link between discrimination and depression.

2. Methods

2.1. Setting and participants

This study is based on data from the Students' Health and Wellbeing Study (SHOT), a nationwide survey targeting students enrolled in higher education in Norway. Since 2010, SHOT has been conducted every four years, with the most recent wave, SHOT2022, carried out between February 8 and April 19, 2022. The SHOT2022 survey captured a wide array of health and lifestyle indicators, including mental health, suicidality, sleep, substance use, social relationships, and exposure to discrimination. Detailed methodology for SHOT has been described previously (Sivertsen et al., 2019b).

SHOT2022 was administered digitally via a web-based questionnaire distributed to all Norwegian full-time students in higher education, both in Norway and abroad. Students were invited through emails, SMS messages, and coordinated promotion by student welfare organizations and educational institutions. A total of 169,572 students were invited, and 59,544 students completed the survey after two reminders, yielding a response rate of 35.1 %. Participation rates across Norway's four health regions were relatively similar (32.1 % to 37.5 %), based on aggregated data from the Norwegian State Educational Loan Fund.

As part of SHoT2022, students were invited to consent to participation in a follow-up study on mental disorders. A total of 26,311 students provided consent. From this pool, 16,418 students were randomly selected for follow-up, with intentional oversampling of male students to improve the sex distribution relative to the broader SHoT2022 cohort. Despite this effort, lower participation rates among male students resulted in 70.4 % of those invited to the follow-up identifying as female. Ultimately, 10,460 students completed at least one diagnostic module in the follow-up assessment, yielding a conditional response rate of 63.7 %. This follow-up, referred to as the CIDI study, was conducted between January 24 and February 6, 2023, approximately one year after SHoT2022. In total, 7884 students had valid data on discrimination status and on CIDI and were included in the present analyses. A flowchart of participation is presented in Fig. 1.

2.2. Instruments

2.2.1. Sociodemographic information

Demographic information, including age and sex, was retrieved from the Norwegian national identity number. Additional background variables were drawn from SHOT2022, including relationship status (e.g., single, cohabiting, married) and migration background (whether the student or their parents were born outside Norway).

2.3. Discrimination

Experiences of discrimination were assessed in SHoT2022 using the question: “During the past 12 months, have you personally felt discriminated against or harassed for any of the following reasons?” Participants could select all options that applied (i.e., a multiple-response format). The available response categories were: ethnic origin, religion or belief, gender, gender identity, gender expression, sexual orientation, age, disability, skin colour, and political opinions, as well as No, I have not experienced discrimination. Each option was coded dichotomously (0 = not endorsed, 1 = endorsed) and treated as an independent domain of discrimination in the analyses. This question was adapted from LGBT survey in the European Union in 2012 (European Union Agency for Fundamental Rights - FRA, 2012). The items on gender, gender identity, and gender expression were worded in accordance with the phrasing used in the SHoT2022 questionnaire and reflect participants' own understanding of these as perceived reasons for discrimination, rather than formal theoretical definitions.

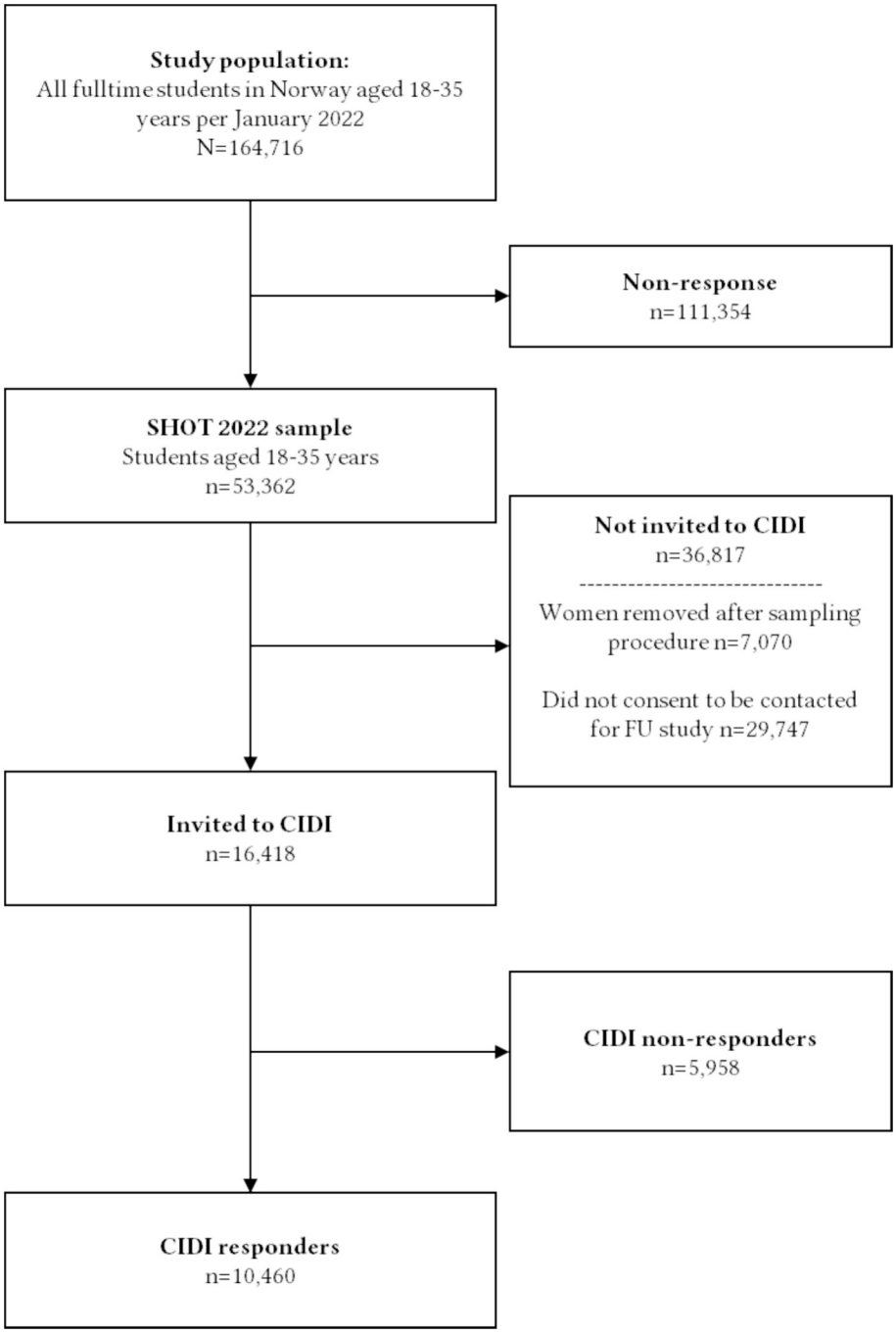

Fig. 1. Flowchart of study participants.

2.3.1. Transgender-specific discrimination experiences

Two modules were administered to participants who selected "Other" in response to the question "What is your gender?". These items captured transgender-specific experiences of discrimination in both defined social contexts and everyday interactions.

The first module assessed context-specific discrimination over the past 12 months, asking: "In the past 12 months, have you personally felt discriminated against because you are a transgender person in any of the following situations?" The listed contexts included: at one's place of study, when searching for housing to rent or buy (e.g., from landlords or property agents), by healthcare personnel (e.g., receptionist, nurse, or physician), when applying for a job, at a café, restaurant, bar, or nightclub, in a shop, and when presenting identification or other official documentation showing gender. Response options were Yes, No, Have not been in such a situation, and Don't know. A total count score (range 0–7) was calculated based on the number of situations in which discrimination was reported ("Yes").

The second module assessed the frequency of everyday discriminatory treatment during the past six months, asking: "How often have the following things happened in your daily life because you are perceived as a transgender person?" Items included being treated less politely, treated with less respect, receiving poorer service (e.g., in restaurants or shops), being perceived as not competent, feared, dishonest, or inferior, and being followed by others in public places (e.g., in a shop). Additional items repeated key content for consistency (treated less politely, with less respect, or receiving poorer service). Each item was rated on a five-point scale (0 = not happened in the past six months, 1 = once, 2 = 2–5 times, 3 = 6 times or more, 4 = don't know). A total frequency score was

computed by summing responses, with higher scores reflecting more frequent discriminatory experiences.

2.3.2. Psychological distress: HSCL-25

Psychological distress at baseline (SHOT2022) was measured using the 25-item version of the Hopkins Symptom Checklist (HSCL-25), a well-established instrument frequently used in population-based research to assess symptoms of anxiety and depression (Derogatis et al., 1974). Respondents rated the extent to which each symptom bothered them for the past two weeks on a four-point scale (1 = "not at all" to 4 = "extremely"), and the overall score was calculated as the mean of all items. For analytical purposes, distress was categorized using sex-specific cut-off values previously validated in a Norwegian student sample: ≥1.96 for males and ≥2.2 for females. These thresholds were selected for their improved sensitivity and specificity compared to the traditional 1.75 cut-off (Sivertsen et al., 2024). The resulting binary variable was included in fully adjusted models (Model 2) to control for pre-existing mental health symptoms that could confound the prospective relationship between discrimination and MDE.

2.4. Mental disorders: CIDI

A newly developed self-administered electronic version of the CIDI (Composite International Diagnostic Interview), created for the WHO World Mental Health Surveys (World Health Organization, 1992) was used for the data collection (Kessler and Ustun, 2004). A detailed description of the development of this self-administered CIDI version has been published elsewhere (Sivertsen et al., 2023). In short, CIDI 5.0 is a standardized interview assessing 30-days, 12 months and lifetime prevalence for several mental and substance use disorders according to diagnostic criteria in the Diagnostic and Statistical Manual of Mental Disorders 5th edition (American Psychiatric Association, 2013). The CIDI has good concordance with diagnostic instruments such as the Structured Clinical Interview for DSM-IV (Haro et al., 2006) and Schedules for Clinical Assessment in Neuropsychiatry (Jordanova et al., 2004). The Norwegian version of the CIDI is based on the official Norwegian translation of CIDI. 5.0, as described in a previous study protocol publication (Knudsen et al., 2020).

In the present study, the CIDI was used to assess DSM-5 criteria for major depressive episode (MDE) during the past 30 days (i.e., current MDE). In addition, 12-month and lifetime MDE were also assessed. However, participants who met criteria only for past (12-month or lifetime) MDE, but not current MDE (n = 2789), were excluded from the main analyses, as the study focused on depression occurring after the SHoT2022 data collection. This exclusion ensured that the temporal sequence between exposure (self-reported discrimination in SHoT2022) and outcome (new or persistent MDE) was maintained. Participants with only past MDE were considered to have experienced depressive episodes prior to the discrimination assessment and were therefore excluded to avoid reverse causality. The operationalization of MDE followed WMH diagnostic algorithms.

2.5. Statistical analyses

Analyses were conducted on unweighted data, as the age and sex distribution of the analytic sample closely matched the source population. Descriptive statistics were calculated for responders and non-responders to the CIDI follow-up. Between-group comparisons used Chi-square tests for categorical variables and *t*-tests for continuous variables. We used Poisson regression with robust standard errors to estimate relative risks (RRs) and 95 % confidence intervals (CIs) for the association between discrimination and MDE. Poisson regression with robust standard errors was chosen over logistic regression to provide more accurate relative risk estimates for binary outcomes with non-rare prevalence. Each type of discrimination was modelled in a separate regression to estimate its independent association with MDE. Two models were estimated: Model 1, adjusted for age, and Model 2, which additionally adjusted for baseline psychological distress (HSCL-25), categorized using sex-specific cut-offs. To assess sex differences, we included interaction terms between sex and discrimination and additionally conducted all analyses stratified by sex. A dose-response relationship was examined by modelling the number of reported discrimination types (0, 1, 2, 3, 4+) as a categorical predictor of MDE. To test the robustness of the observed associations, we conducted sensitivity analyses in which all models were additionally adjusted for baseline psychological distress (HSCL-25). All analyses were conducted using IBM SPSS version 30.

2.6. Ethics

The study was approved by the Regional Committee for Medical and Health Research Ethics in Western Norway (no. 2022/326437).

3. Results

3.1. Sample characteristics and representativeness

Table 1 compares CIDI responders with both non-responders and the full SHoT2022 sample on key demographic and clinical variables. The prevalence of self-reported discrimination was nearly identical among responders and non-responders (26.1 % vs. 25.9 %; $p = .75$), though slightly higher than in the full SHoT2022 sample (23.4 %; $p < .001$), indicating a modest overrepresentation of students with discrimination experiences. Mean psychological distress (HSCL-25) at baseline scores did not differ significantly between responders and non-responders (M = 1.88 vs. 1.89; $p = .30$; Cohen's d = 0.03), indicating minimal response bias. Sociodemographic characteristics were broadly similar across groups. Differences in parental education, cohabitation status, and migrant background were small and of limited practical significance, with *p*-values ranging from .02 to .17. Together, these findings suggest that the CIDI follow-up sample is largely representative of the full SHoT2022 cohort in terms of both psychosocial and demographic profile.

3.2. Prevalence of discrimination

Fig. 2 presents the prevalence of each reported discrimination type among 7884 students (with valid data on discrimination status and on CIDI), shown separately for females and males. Among females, gender-based discrimination was most common (19.9 %), followed by age (6.2 %). Political opinion (4.9 %) and ethnic origin (4.1 %) were also reported at notable levels, while religion, skin colour, sexual orientation, gender identity, and gender expression each affected between 1 % and 3 % of females.

For males, the ranking differed slightly. Political opinion was the most frequently reported discrimination (5.8 %), followed by gender-based discrimination (4.8 %), ethnic origin (4.6 %), and skin colour (2.7 %). Discrimination based on disability, sexual orientation, or gender identity each affected approximately 1–3 % of males.

3.3. Discrimination and MDE

Fig. 3 shows RRs for MDE across discrimination types, stratified by sex. Across nearly all domains, discrimination was associated with increased risk of current MDE, although effect sizes varied by sex and discrimination category.

Sexual orientation discrimination emerged as the strongest predictor for both females (RR = 2.75, 95 % CI = 2.21–3.38) and males (RR = 1.94, 95 % CI = 1.16–3.02). Discrimination based on gender identity and gender expression also carried high RRs, particularly for males (RR = 2.86, 95 % CI = 1.42–5.08 for identity; RR = 3.06, 95 % CI = 1.46–5.60 for expression) and females (RR = 2.61, 95 % CI = 1.88–3.52

Table 1
Sociodemographic and clinical characteristics in 2022 of the CIDI responders, CIDI non-responders and the overall SHOT2022 sample.

Characteristic	CIDI responders (n = 10,460)	CIDI non-responders (n = 5958)	p-value[#]	SHOT2022* (n = 53,362)	p-value[#]
Age, mean (SD)	24.03 (3.28)	23.97 (3.24)	.24	23.98 (1.85)	.14
Sex, % (n)			.97		<.001
Females	70.6 (7386)	70.4 (4196)		66.4 (35,423)	
Males	29.4 (3074)	29.6 (1762)		33.6 (17,939)	
Marital status, % (n)			.16		.70
Single	51.2 (5359)	50.3 (2994)		51.0 (27,197)	
Boy−/girlfriend	22.4 (2343)	23.7 (1414)		22.8 (12,152)	
Cohabitant	22.7 (2375)	22.5 (1340)		22.6 (12,058)	
Married/registered partner	3.3 (345)	3.0 (178)		3.1 (1667)	
Self and/or parent(s) born abroad, % (n)			.17		.34
Born in Norway	81.2 (8491)	80.4 (4792)		80.1 (43,052)	
Born outside Norway	10.0 (1043)	10.9 (651)		10.4 (5541)	
Maternal education, % (n)			.04		.50
Primary	4.4 (457)	5.3 (313)		4.5 (2407)	
Secondary	27.3 (2857)	27.6 (1646)		27.6 (14,707)	
College/university	65.6 (6858)	64.2 (3827)		64.3 (34,326)	
Paternal education, % (n)			.02		.52
Primary	5.7 (599)	6.8 (406)		6.0 (3182)	
Secondary	35.2 (3678)	24.9 (2078)		35.1 (18,735)	
College/university	54.2 (5674)	52.8 (3145)		53.3 (28,446)	
Discrimination experience (any), % (n)	26.1 (2601)	25.9 (1712)	.75	23.4 (13,904)	<.001
HSCL-25, Mean (SD) [$]	1.88 (0.61)	1.89 (0.61)	.30	1.86 (0.59)	.01

SHOT2022: Students' Health and Wellbeing Study 2022; CIDI: Composite International Diagnostic Interview; HSCL-25 Hopkins Symptoms Checklist - 25-item version.
* Grand mean for the SHOT2022 sample aged 18–35.
[#] Compared with the CIDI responders group (p-values based on Chi-squared test (categorical variables) or t-test (continuous variables).

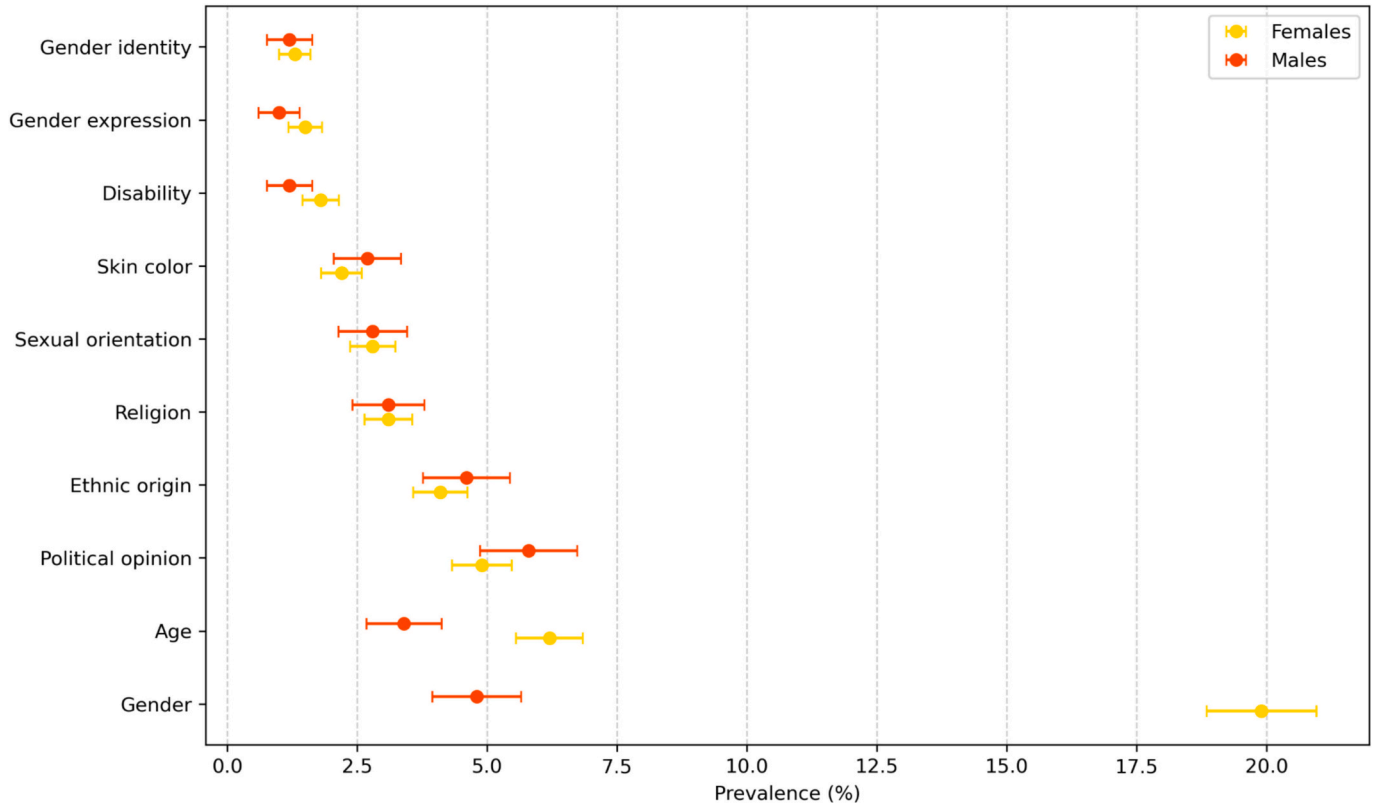

Fig. 2. Prevalence of self-reported discrimination experiences by type and sex among students in higher education (N = 7884). The figure displays the proportion of female and male students who reported experiencing each type of discrimination, with 95 % confidence intervals. Discrimination categories are ordered by descending prevalence among females. Data are based on responses to SHOT2022 and include only participants with complete diagnostic data.

for identity; RR = 2.14, 95 % CI = 1.53–2.90 for expression).

Discrimination due to political opinion, disability, ethnic origin, and skin colour were all significantly associated with MDE in both sexes, with RRs typically ranging from 1.70 to 2.60. As examples, disability-based discrimination was associated with an RR of 2.62 (95 % CI = 1.99–3.37) in females and 2.50 (95 % CI = 1.25–4.44) in males; political discrimination yielded an RR of 2.19 (95 % CI = 1.81–2.62) for females and 2.31 (95 % CI = 1.64–3.18) for males. Religion and age discrimination showed more modest associations, especially among men, where confidence intervals crossed 1.0 for religion (RR = 1.29, 95 % CI =

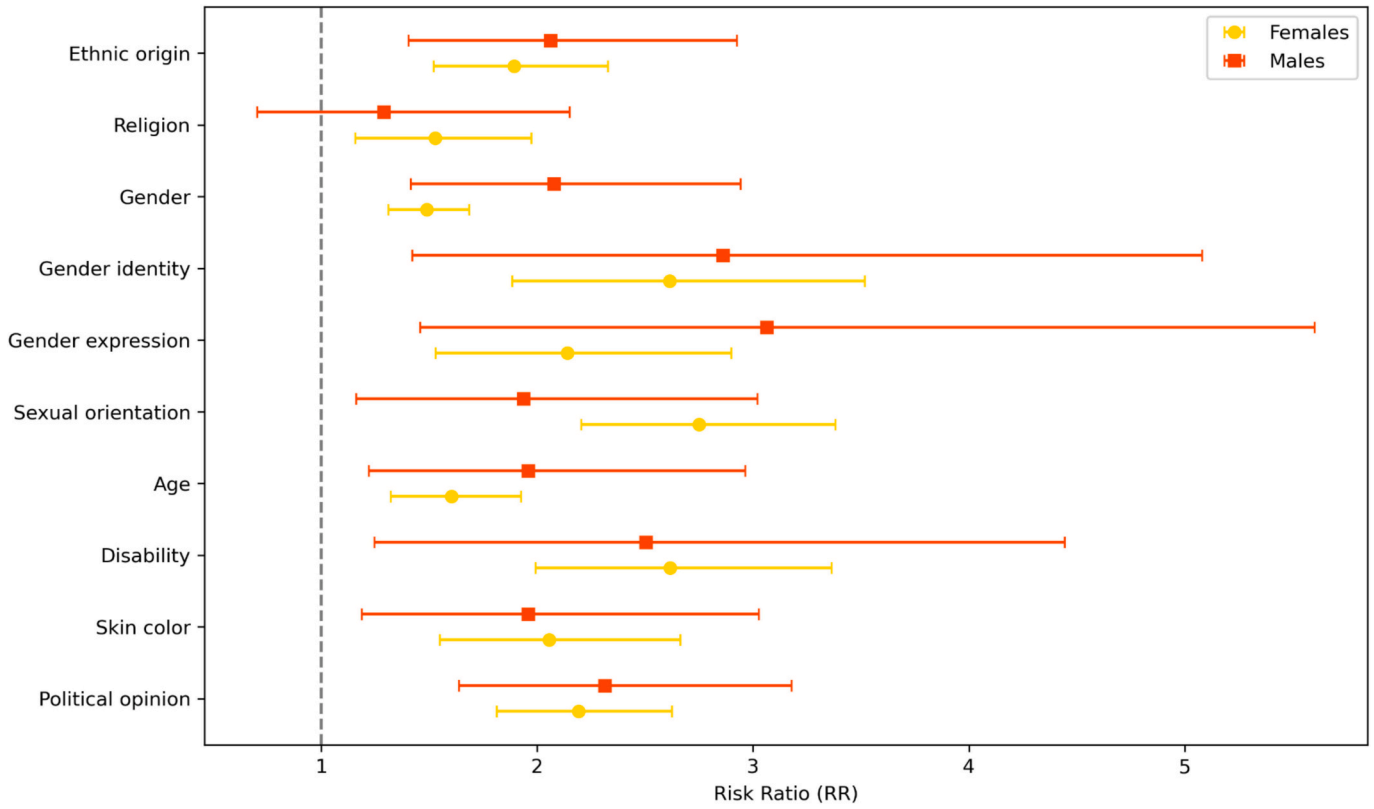

Fig. 3. Relative risk (RR) of mental disorder by type of discrimination. Each point represents the RR (with 95 % confidence interval) of reporting a mental disorder associated with having experienced a specific type of discrimination, adjusted for age. The horizontal dashed line at RR = 1.0 represents the null reference (no increased risk).

0.70–2.15). Lastly, gender-based discrimination was associated with increased risk in both sexes but was somewhat higher for males (RR = 2.08, 95 % CI = 1.42–2.94) than females (RR = 1.49, 95 % CI = 1.31–1.69).

As detailed in Fig. 4, there was a clear dose-response relationship between the number of discrimination types reported and the risk of

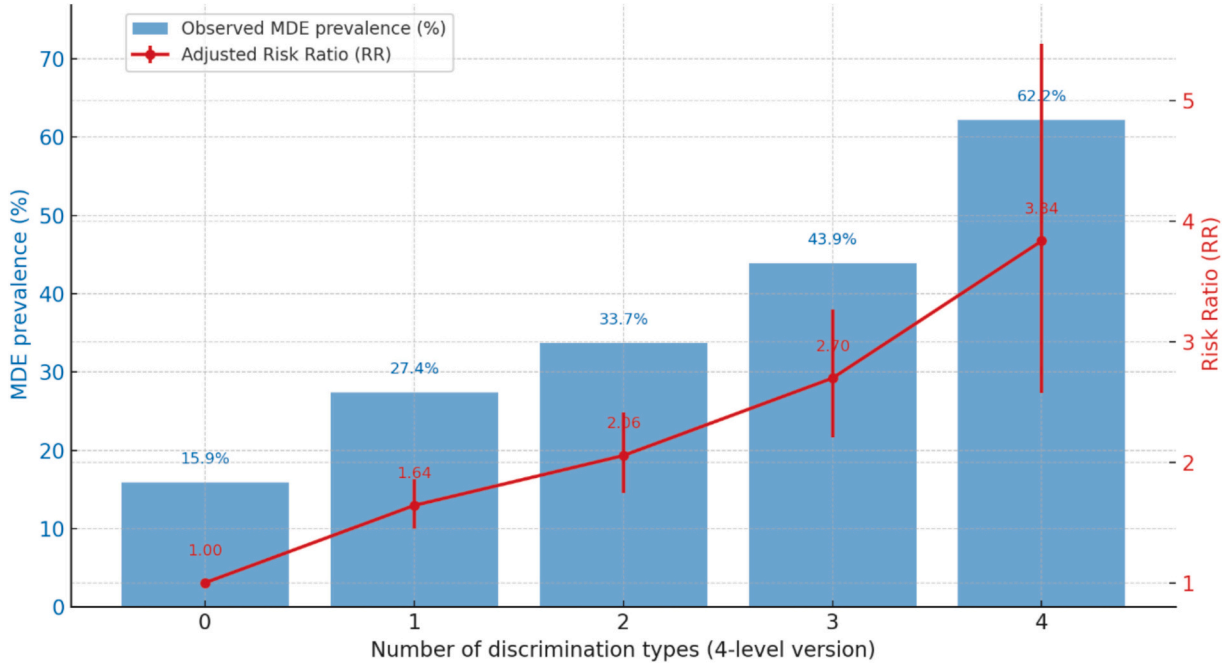

Fig. 4. Dose-response relationship between number of discrimination types and MDE. The figure shows the observed prevalence of MDE across categories of self-reported discrimination (blue bars), and the adjusted risk ratios (RRs) with 95 % confidence intervals from a Poisson regression model (red line with dots). The model adjusts for age and sex. (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

MDE. Compared to students reporting no discrimination, the adjusted risk of MDE increased steadily with the number of discrimination types: RR = 1.64 (95 % CI: 1.45–1.86) for one type, RR = 2.06 (95 % CI: 1.74–2.41) for two types, RR = 2.70 (95 % CI: 2.21–3.27) for three types, and RR = 3.84 (95 % CI: 2.57–5.48) for four or more types. Observed prevalence of MDE increased from 15.9 % among those reporting no discrimination to 62.2 % among those exposed to four or more types. The interaction term between sex and discrimination count was not statistically significant ($p = .254$).

3.4. Sensitivity analyses

To account for potential confounding by baseline psychological distress, all models were re-estimated with additional adjustment for HSCL-25 scores (Model 2). As shown in Table 2, associations between discrimination and subsequent MDE were attenuated in both females and males, but most remained statistically significant. Among females, RRs declined by 10 to 27 %. The largest reduction was seen for sexual orientation discrimination, from 2.87 (95 % CI: 2.33, 3.54) to 2.33 (95 % CI: 1.86, 2.91), a 26.7 % decrease. Similar reductions were found for gender identity (25.9 %), disability (23.3 %), and skin colour (21.1 %), with all associations remaining significant. Among males, reductions ranged from 12 to 26 %. Sexual orientation discrimination showed the greatest drop, from 2.39 to 1.89 (25.4 %), followed by gender identity (24.9 %), ethnicity (22.5 %), and disability (21.7 %). Most associations remained statistically significant.

These results suggest that while baseline distress explains part of the observed associations, discrimination remains an independent risk factor for MDE across both sexes.

4. Discussion

This study provides evidence that exposure to discrimination is a significant and graded predictor of MDE among university students. Using data from a large, nationally representative sample and structured diagnostic interviews (CIDI 5.0), we found that students who reported one or more types of discrimination at baseline were at markedly increased risk of MDE one year later. These findings extend previous work by demonstrating a dose-response association between the number of discrimination types reported and the likelihood of depression, using validated diagnostic criteria rather than self-reported symptom scales. Students reporting exposure to four or more discrimination types had nearly four times the risk of MDE compared to those reporting none.

Our results are consistent with earlier findings from both student and general populations, which show that perceived discrimination is a potent risk factor for mental health problems, particularly depression (Pascoe and Smart, 2009; Williams and Mohammed, 2009; Hudson et al., 2013). However, the present study advances the field in several important ways. First, the linkage of survey data with follow-up diagnostic interviews reduces the likelihood of common method bias and strengthens temporal inference. Second, the five-level exposure measure allowed us to characterize the dose-response pattern with greater precision. Third, we found that virtually all discrimination domains were independently associated with MDE, although effect sizes varied by sex and domain. Finally, the adjustment for baseline psychological distress provides a more rigorous test of the prospective association, reducing the possibility of reverse causality.

The observed prevalence of MDE was high. A high burden of mental disorders in student populations has been documented in earlier SHoT studies, and possible explanations have been discussed elsewhere (Sivertsen et al., 2023). Notably, the high MDE rates observed here underscore the importance of identifying and addressing risk factors such as discrimination. Moreover, we observe that this risk factor (discrimination) is common among students.

Several mechanisms may explain how discrimination may lead/is linked to depression. The minority stress model posits that exposure to stigma, prejudice, and discrimination generates chronic social stress that can erode psychological well-being, particularly among sexual and gender minorities (Hatzenbuehler, 2009; Meyer, 2003). Such experiences may lead to internalized stigma, expectations of rejection, and concealment of identity, all of which increase vulnerability to depression (Hatzenbuehler, 2009). Beyond minority stress processes, discrimination is also linked to reduced social belonging, heightened rumination, and physiological stress responses that may contribute to depressive symptomatology (Pascoe and Smart, 2009; Williams and Mohammed, 2009). Together, these pathways underscore discrimination as a chronic psychosocial stressor with both psychological and biological sequelae.

Our findings also shed light on sex differences. While females were more likely to report certain types of discrimination (e.g., gender, age), males showed equal or higher relative risks for MDE following exposure to discrimination related to gender identity, gender expression, and political opinion. The non-significant interaction between sex and discrimination count suggests that the cumulative effect of discrimination is similarly harmful across sexes. These findings challenge assumptions that females are uniformly more affected by discrimination and emphasize the need for inclusive mental health strategies that address risks across gender identities.

The somewhat stronger association between gender-based discrimination and MDE among males may reflect sex-related differences in coping and socialization. Males often face societal expectations to appear emotionally resilient and self-reliant, which can discourage disclosure of distress or help-seeking following discriminatory experiences (Seidler et al., 2016). Limited social support and internalization of stigma may therefore intensify the psychological effects of gender-based discrimination in males, even when exposure levels are lower than in

Table 2
Sensitivity analysis: Associations between discrimination types and major depressive episode (MDE), by sex and model. Model 1: Adjusted for age. Model 2: Additionally adjusted for baseline distress (HSCL-25). Percent reduction in RR (relative risk) is calculated for Model 2 relative to Model 1.

Discrimination type	Females			Males		
	Model 1 RR (95 % CI)	Model 2 RR (95 % CI)	% RR reduction	Model 1 RR (95 % CI)	Model 2 RR (95 % CI)	% RR reduction
Ethnic origin	1.71 (1.43–2.04)	1.45 (1.21–1.75)	36.6	1.80 (1.34–2.41)	1.56 (1.15–2.11)	30.0
Religion	1.42 (1.15–1.76)	1.21 (0.97–1.50)	50.0	1.49 (1.01–2.19)	1.28 (0.87–1.88)	42.9
Gender	1.55 (1.35–1.78)	1.36 (1.18–1.58)	34.5	1.47 (1.11–1.96)	1.29 (0.96–1.73)	38.3
Gender identity	2.38 (1.87–3.04)	2.00 (1.55–2.59)	27.5	2.65 (1.76–3.98)	2.24 (1.47–3.42)	24.8
Gender expression	2.01 (1.63–2.47)	1.69 (1.34–2.14)	31.7	1.85 (1.29–2.66)	1.58 (1.09–2.30)	31.8
Sexual orientation	2.87 (2.33–3.54)	2.33 (1.86–2.91)	28.9	2.39 (1.64–3.48)	1.89 (1.29–2.77)	36.0
Age	1.48 (1.26–1.74)	1.28 (1.08–1.53)	41.7	1.43 (1.05–1.96)	1.23 (0.90–1.69)	46.5
Disability	1.92 (1.52–2.43)	1.55 (1.21–1.98)	40.2	2.11 (1.42–3.13)	1.73 (1.14–2.63)	34.2
Skin colour	2.27 (1.90–2.72)	1.89 (1.56–2.30)	29.9	2.47 (1.77–3.45)	2.00 (1.41–2.83)	32.0
Political opinion	1.70 (1.45–2.00)	1.50 (1.27–1.78)	28.6	1.79 (1.36–2.36)	1.55 (1.16–2.07)	30.4
Any discrimination	1.83 (1.64–2.05)	1.25 (1.11–1.40)	69.9	2.26 (1.80–2.83)	1.36 (1.08–1.71)	71.4

females (Mahalik et al., 2007).

The use of CIDI 5.0 to assess MDE is a key strength, offering improved diagnostic precision over symptom-based measures. The large sample size, high diagnostic data quality, and national coverage enhance generalizability. Furthermore, the ability to account for baseline distress strengthens causal inference. By examining multiple discrimination domains simultaneously, the study also addresses a gap in the literature related to intersectionality and the compounding effects of multiple forms of disadvantage (Denise, 2012).

Nonetheless, some limitations should be acknowledged. First, self-reported discrimination may reflect both actual experiences and individual differences in perception or sensitivity to social stressors. Students who are more attuned to interpersonal rejection or unfair treatment may be more likely to report discrimination, potentially overlapping with underlying factors related to depression. This possible reporting or perception bias should therefore be considered when interpreting the observed associations. Second, discrimination was assessed only at one time point and via self-report, which may not capture intensity, frequency, or context. Although follow-up occurred one year later, the design remains observational, and residual confounding cannot be ruled out. Third, the self-administered CIDI has not yet been fully validated against face-to-face versions, and it remains uncertain whether CIDI-defined MDE aligns perfectly with clinical diagnoses. Despite oversampling efforts, females were overrepresented among responders, which may affect the precision of sex-specific estimates. Finally, because students with a history of, but not current, depression were excluded, our findings primarily apply to new-onset or recurrent MDE following the baseline survey.

Despite these limitations, the findings have clear implications for policy and practice. The strong and graded association between discrimination and MDE highlights the importance of addressing discrimination on campus. Preventive measures should be inclusive and intersectional, acknowledging that students with multiple marginalized identities are at greatest risk. Institutional strategies could include anti-discrimination training for staff, anonymous reporting systems, and better mental health screening protocols that assess discrimination exposure. Although higher education institutions play a critical role in fostering inclusive and equitable environments, discrimination also occurs in broader societal contexts such as workplaces, housing, healthcare, and public spaces. Effective prevention therefore requires multilevel approaches that extend beyond campuses, combining institutional, community, and policy-level efforts to reduce structural discrimination and its health consequences.

In conclusion, this study underscores that discrimination is not only a social justice issue but also a clinically meaningful determinant of student mental health. Reducing discrimination and supporting affected students may improve both psychological well-being and educational outcomes. Given ongoing increases in mental health problems among young adults, understanding and addressing social determinants like discrimination is essential. Future research should explore underlying mechanisms and evaluate targeted interventions aimed at reducing the mental health burden associated with discrimination.

Analytic code availability

The analytic code supporting the reported findings is available upon request from the corresponding author (BS).

Research material availability

Not applicable.

Transparency declaration

The manuscript provides an honest, accurate, and transparent description of the study. No important details have been omitted, and any deviations from the original study plan are clearly explained.

CRediT authorship contribution statement

Børge Sivertsen: Writing – original draft, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Lasse Bang:** Writing – review & editing, Methodology, Conceptualization. **Benedicte Kirkøen:** Writing – review & editing, Methodology, Conceptualization.

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Declaration of competing interest

The authors 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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Data availability

Data sharing is restricted by Norwegian data protection regulations and GDPR. However, researchers can request access to participant data by contacting the SHoT publication committee (borge.sivertsen@fhi.no). Data access requires approval from the Norwegian Regional Committee for Medical and Health Research Ethics (https://helseforskning.etikkom.no). The dataset is managed by the NIPH, and further information regarding data access procedures is available at https://www.fhi.no/en/more/access-to-data.

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