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Original Article

Mental health and suicidal ideation from 2010 to 2023 among university students: national repeated cross-sectional analysis

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Background

Mental health problems among university students have been on the rise, with particularly high levels reported during the COVID-19 pandemic. While many studies have examined the immediate effects of the pandemic, long-term trends in anxiety, depression, non-suicidal self-harm (NSSH) and suicidality remain less explored.

Aims

To investigate trends in mental health problems among Norwegian higher education students before, during and after the COVID-19 pandemic, focusing on anxiety, depression, NSSH and suicidality.

Method

The Students' Health and Wellbeing Study (SHOT) is a national survey of Norwegian students, with data from six waves (2010–2023). Four primary waves (2010, 2014, 2018 and 2022) were supplemented by two additional waves during the COVID-19 pandemic (2021 and 2023), including nearly 200 000 students across all waves. Mental health outcomes were measured using the Hopkins Symptom Checklist(HSCL). Sex-specific cut-offs were applied to estimate the prevalence of major depressive episodes (MDE) and generalised anxiety disorder (GAD). Secondary outcomes included NSSH, suicidal thoughts and suicide attempts.

Results

Mental health problems increased consistently over the 13 years, with a more pronounced rise among women. Mean HSCL scores significantly increased for both sexes from 2010 to 2023, peaking during the COVID-19 lockdown in 2021, followed by a slight decline in 2022, but remaining higher than pre-pandemic levels. The prevalence of MDE and GAD followed similar patterns, increasing from 12.5 to 33.7% in women and 9.4 to 26.8% in men. Reports of NSSH also surged post-lockdown, particularly among women, while suicidal thoughts and attempts increased, especially in women, between 2021 and 2022.

Conclusion

Student mental health has worsened over the past decade. Although there was some post-pandemic improvement, rates of anxiety, depression and suicidality remain high. These findings underscore the continued importance of tiered mental health support and structural interventions within higher education to address student mental health.

Keywords

Mental health trends; university students; anxiety and depression; non-suicidal self-harm (NSSH); COVID-19 impact.

Mental health problems among young adults, particularly among students in higher education, have gained increasing attention in recent decades.[1] Students face unique stressors, academic demands, social integration challenges, and the transition to independent living, which may heighten their vulnerability to psychological distress. Broader societal and economic changes have added to these pressures.[2] Recent evidence suggests that the rise in mental health problems among students is multifactorial, involving greater diversity in the student population, increased academic and financial demands and existential concerns such as climate change.[3,4] Data from the nationwide Students' Health and Wellbeing Study (SHOT) survey of Norwegian students showed rising levels of anxiety and depression from 2010 to 2018.[5] These trends have prompted increasing concern about a mental health crisis among students, as highlighted in several recent reviews and studies.[6–9]

The outbreak of the COVID-19 pandemic in early 2020 brought unprecedented disruption to the lives of students in higher education worldwide. The pandemic's impact on mental health was immediate and profound, particularly during the strict lockdowns imposed to curb the spread of the virus.[10–13] In Norway, the government implemented several public health measures, including the closure of universities, restrictions on social gatherings and a shift to online learning. These containment and mitigation measures, while necessary, seem to have had significant unintended consequences for students' mental well-being. The 2021 SHOT survey, conducted during the height of the pandemic, highlighted the mental health toll on students of these public health measures.[11] Many students also reported feelings of loneliness and isolation, which were exacerbated by the restrictions on social activities and the closure of campuses.[14]

As Norway lifted COVID-19 restrictions in 2022, there was optimism that the student mental health crisis might subside. However, early evidence indicates that the challenges exacerbated by the pandemic persist. A recent study published in The Lancet Regional Health – Europe further underscores this concern.[15] This study, which utilised a self-administered electronic version of the Composite International Diagnostic Interview (CIDI 5.0), found that a significant proportion of Norwegian students continued to experience mental health problems a year after the restrictions were lifted. Approximately 40% of female students and 26% of male students were identified as having a current mental disorder, with major depressive episodes (MDE) and generalised anxiety disorder (GAD) being the most prevalent. While not indicative of a post-pandemic worsening, these findings show that mental health problems remained elevated beyond the acute phase of the pandemic.

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Furthermore, despite increasing public awareness and improvements in mental health literacy, stigma remains a major barrier to care-seeking among university students.[16] Such findings underscore the urgent need for ongoing monitoring of student well-being in higher education. It is also important to examine whether the elevated mental health problems observed during and after the pandemic mark a distinct deviation from, or simply an intensification of, the upward trends already underway in the pre-pandemic era.

The present study aimed to examine long-term trends in mental health and suicidal ideation among Norwegian students in higher education from 2010 to 2023. Drawing on repeated cross-sectional data from the SHOT study, this analysis spans both the pre-pandemic and pandemic periods, as well as post-pandemic follow-up. Specifically, we sought to: a) document trends in mental health problems across six waves of the SHOT study from 2010 to 2023; b) assess changes in suicidal thoughts, suicide attempts and non-suicidal self-harm (NSSH) across selected waves from 2018 to 2022; and c) examine long-term trends in suicidal ideation from 2010 to 2023.

We hypothesised that (a) mental health problems would show a steady increase from 2010 to 2023, with elevated levels during the COVID-19 pandemic; (b) the prevalence of suicidal thoughts, suicide attempts and NSSH would increase between 2018 and 2022, particularly during and following the pandemic; and (c) suicidal ideation would display a long-term upward trend from 2010 to 2023.

Method

Study design, participants and setting

The SHOT study is a national survey of students in higher education in Norway, initiated by the three largest student welfare organisations. So far, four comprehensive health surveys of the student population (aged 18–35) in Norway have been completed (2010, 2014, 2018 and 2022). Additionally, two smaller surveys were conducted in 2021 (during the COVID-19 lockdown) and in 2023, with the latter focusing on mental health symptoms and disorders. All waves collected data electronically through a web-based platform, and were designed as independent, cross-sectional surveys.

Details of the SHOT study have been published elsewhere.[17] In short, the SHOT 2010 study was conducted between 11 October and 8 November 2010. The target group was a random sample of 26 779 Norwegian full-time students, of whom 6053 students completed the survey, yielding a response rate of 22.6%. The SHOT 2014 study was conducted between 24 February and 27 March 2014. An invitation email containing a link to an anonymous online questionnaire was sent to 47 514 randomly selected students and stratified by study institutions, faculties and departments. The overall response rate was 28.5% and included 13 525 students.

The SHOT 2018 study was conducted between 6 February and 5 April 2018, inviting all full-time Norwegian students pursuing higher education (both in Norway and abroad). For the SHOT 2018 study, 162 512 students fulfilled the inclusion criteria, of whom 50 054 students completed the online questionnaires, yielding a response rate of 30.8%. The SHOT 2021 study was conducted between 1 March and 6 April 2021. This was a shorter health survey focusing specifically on health outcomes during the COVID-19 lockdown. In all, 181 828 students were invited to participate, of which 62 498 students completed the survey, yielding a response rate of 34.4%. The SHOT 2022 study was conducted between 6 March and 19 April 2022. In all, 169 572 students were invited to participate, of which 59 544 students completed the survey, yielding a response rate of 35.1%. When consenting to participate in the SHOT 2022 study, students were also asked to indicate if they wished to be invited to a follow-up study on mental health, of whom 26 311 consented. To approximate a balanced sex distribution as in the base-study population, comparatively more males than females were invited to the follow-up survey, yielding a sample of 16 418 students (who were still officially registered as students in January 2023). Of these, 10 460 students participated. A random half of this sample (5076) completed the Hopkins Symptom Checklist (HSCL-25) before the CIDI 5.0, while the other half completed the assessments in the reverse order. This sequencing was intentionally designed to allow for future investigations into whether the order of the HSCL-25 administration influences the results. For the current study, we used only the observations where the HSCL-25 was administered prior to the CIDI, as screening instruments are typically not administered after full diagnostic assessments in population-based surveys. This follow-up study was conducted between 24 January and 6 February 2023.

Although recruitment procedures varied across waves, each survey was designed to be broadly representative of the Norwegian higher education student population at the time of data collection. From 2018 onwards, sampling transitioned to full-population approaches. The 2023 follow-up oversampled males to address sex imbalance.

All parts of the project, including the planning of research questions, selection of study questionnaires, piloting, collection of data, as well as utilisation of data and findings, were conducted in close collaboration with the student welfare organisations in Norway, where student representatives were present. The email and SMS invitation included a brief description of the study aim, which was to broadly examine students' health and wellbeing.

While the pandemic has had a major impact worldwide, countries have differed in their response and the nature and extent of restrictions imposed, as well as mortality rates.[18,19] In Norway there was a relatively low infection rate compared to other European countries. While there were no complete lockdowns or nationwide curfews, containment measures to restrict social contact, including the closure of, or limited access to, campuses and restrictions on many other services were common in some regions and in most large cities. The SHOT 2021 data collection was completed between 1 March and 6 April and there were several levels of national and regional restrictions during this period. There were both national and regional restrictions in place, resulting in predominantly online teaching and closed campuses. By the time of the 2022 data collection, most national and regional restrictions in Norway had been lifted just before the survey period began. However, some restrictions remained, and students were offered a hybrid model of live and online teaching.

Procedure and measures

From 2018 onwards, participants' age and sex were extracted from their 11-digit Norwegian national identity number, whereas in the 2010 and 2014 studies, these data were based on self-report. Mental health problems were assessed using the HSCL-25,[20] in all waves except 2021, where the shorter HSCL-5 was used. The HSCL-5 was employed exclusively in the SHOT 2021 wave to capture symptom severity during the COVID-19 lockdown period. Both versions use a scoring range of 1 ('not at all') to 4 ('extremely'), with a recall period of the past two weeks. The mean HSCL score is calculated by dividing the total score by the number of items. Due to the reduced number and content of items, mean scores on the HSCL-5 tend to differ from those of the HSCL-25, and the two cannot be directly

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compared. Traditionally, a cut-off value of 1.75 on the HSCL-25 has been widely used to indicate major depressive disorder.[21–23] However, recent findings suggest that this universal approach may be inadequate, and sex-specific thresholds have been proposed.[24] Further, the criterion validity of the HSCL-5/25 among college and university students, using an electronic version of the CIDI as the standard, identified optimal cut-off values of 1.96 for males and 2.20 for females for the HSCL-25, and 2.25 and 2.75 for the HSCL-5, respectively.[25] These values were employed in the current study across all SHOT waves as a proxy for the presence of MDE or GAD during the last 30 days.

History of suicidal thoughts, suicide attempts and NSSH were assessed with three items drawn from the Adult Psychiatric Morbidity Survey (APMS);[26] '*Have you ever seriously thought of taking your life, but not actually attempted to do so?*', '*Have you ever made an attempt to take your life, by taking an overdose of tablets or in some other way?*', and '*Have you ever deliberately harmed yourself in any way but not with the intention of killing yourself? (i.e. self-harm)*'. The question about NSSH thoughts was adapted from the Child and Adolescent Self-Harm in Europe study (CASE);[27] '*Have you ever seriously thought about trying to deliberately harm yourself but not with the intention of killing yourself, but not actually done so?*'. If respondents answered yes to any item, the timing of the most recent episode was assessed, using the following response options: 'last week', 'last month', 'past year', 'more than a year ago, but after I started studying at the university' and 'before I started studying at university'. In the current study, we defined 'recent' event as an episode having occurred within the past 12 months (the first 3 response options), and lifetime as the last 2 categories. In addition to the HSCL-5 items, suicidal thoughts were also measured by one additional item of the HSCL-25 ('in the past two weeks, how much have you been bothered by thoughts of ending your life').[20]

Statistical analyses

All statistical analyses were performed using IBM SPSS Statistics 29 for Windows. Estimated marginal means (EMM) were computed using the UNIANOVA procedure in SPSS, which is used for regression analysis and analysis of variance, to examine changes in mental health problems and suicidal ideation, adjusting for age. All analyses were stratified by sex. Cohen's d was calculated to assess effect sizes for mean differences, while Cohen's h was used for comparing proportions. These were interpreted following standard guidelines, where 0.2 indicates a small effect, 0.5 a moderate effect and 0.8 a large effect. As a sensitivity analysis, logistic regression models were conducted to examine the odds of mental health problems (based on dichotomised HSCL-5/25 scores using both the newly published sex-specific cut-offs and the traditional uniform cut-off) across survey years, adjusting for age and sex. This analysis was used to assess whether the observed trends remained statistically significant after accounting for demographic variation across waves. There was generally very little missing data on the included variables across all waves, and the missing values were handled using listwise deletion.

Results

Sample characteristics

The SHOT data from 2010 to 2023 showed some shifts in the demographic composition of its participants. As detailed in Table 1, throughout the study period, the proportion of female participants increased slightly. There was also a notable change in the age distribution of the study population. Initially, the 18–20 age group was the most represented, making up 20.4% of participants in 2010. By 2022, this group's representation declined to 15.9%, indicating a gradual ageing of the study cohort. The 2023 data further highlight this ageing trend, likely because the same participants from 2022 were surveyed again, making the sample naturally one year older.

Changes in mental health problems from 2010 to 2023

As depicted in Fig. 1, panel a, the age-adjusted HSCL-25 continuous scores for both men and women showed a consistent upward trend from 2010 to 2023. This trend was statistically significant for both sexes, with a steeper increase for women, underscored by a significant time × sex interaction ($p < 0.001$). Specifically, mean scores for men increased from 1.42 in 2010 to 1.67 ($d = 0.67$) in 2023, whereas for women, scores rose from 1.62 to 1.96 ($d = 0.89$) over the same timeframe. A similar pattern was evident in the shorter HSCL-5; however, the data from 2021, captured during the COVID-19 lockdown, revealed a pronounced peak in scores for both sexes. The subsequent assessments in 2022 indicated a modest decline, followed by another increase in 2023, and scores remained significantly higher compared to pre-pandemic figures.

Concurrent with the continuous HSCL-25 trends, the estimated prevalence of possible cases of mental disorders using sex-specific cut-offs mirrored the general upward trajectory. This rise was more pronounced among women, with prevalence escalating from 12.5% in 2010 to 33.7% in 2023 ($h = 0.52$), compared to 9.4 to 26.8% ($h = 0.47$) among men, according to HSCL-25 estimates. The HSCL-5 data indicated an acute pandemic impact in 2021 with a sharp rise in approximated GAD/MDE prevalence, which decreased slightly in 2022 before rising again in 2023. Due to utilising sex-specific cut-offs, sex differences were less pronounced than those observed with continuous HSCL scores, but notably, sex disparities widened from 2010 to 2023, as evidenced by the significant interaction term ($p < 0.001$).

Changes in suicidal thoughts, suicide attempts and NSSH from 2018 to 2022

Non-Suicidal Self-Harm (NSSH; Fig. 2, panel a and b): from 2018 to 2022, there was a significant increase in reported lifetime NSSH following the initial COVID-19 lockdown, particularly among women. There was no increase observed for either sex from 2018 to 2021, but the proportion of women reporting lifetime NSSH increased significantly from 23.9% in 2021 to 26.6% in 2022. In contrast, men did not exhibit a similar increase during this period (panel a). Regarding recent NSSH, men showed a consistent upward trend from 2018 to 2022. Conversely, the increase among women was primarily driven by a significant rise from 2021 (4.7%) to 2022 (5.6%) (panel b).

Thoughts of NSSH (Fig. 2, panel c and d): Reflecting a similar pattern to NSSH, there was no increase in lifetime NSSH thoughts from 2018 to 2021. However, there was a significant increase in the year following the lockdown, particularly among women, where the proportion reporting lifetime NSSH thoughts rose from 26.8% in 2021 to 28.4% in 2022. For men, there was a similar increase from 12.8% in 2021 to 14.3% in 2022 (panel c). For NSSH thoughts in the last year, a significant rise was observed in 2022, with women's reports increasing from 10.4% in 2021 to 12.3%, and men's reports from 4.9 to 5.9% (panel d).

Suicidality (Attempts and Thoughts; Fig. 2, panel e–h): While both lifetime and recent suicide attempts remained stable across the study period for men, there was a significant increase among women, largely driven by a rise from 0.47% in 2021 to 0.6% in 2022

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Table 1 Descriptive statistics of study participants in all Students' Health and Wellbeing Study (SHOT) waves

	2010		2014		2018		2021		2022		2023		
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	Statistics
Participants (response rate)	6053	22.6	13525	28.5	50054	30.8	62498	34.4	59544	35.1	10460	63.7[a]	
Gender													$\chi^2 = 195.0$ df = 5, $p < 0.001$
Men	2071	34.2	4581	33.5	15398	30.9	20307	34.4	19967	33.5	1492	29.4	
Women	3982	65.8	9082	66.5	34435	69.1	38718	65.6	39575	66.5	3582	70.6	
Age-group													$\chi^2 = 714.9$, df = 20, $p < 0.001$
18–20	1237	20.4	1767	12.9	8831	17.9	9555	16.1	8494	15.9	875	17.2	
21–22	1711	28.3	3678	26.9	15471	31.4	18060	30.5	16214	30.4	1537	30.3	
23–25	1921	31.7	4887	35.8	15901	32.2	20444	34.5	17504	32.8	1609	31.7	
26–28	753	12.4	2006	14.7	5710	11.6	6917	11.7	6431	12.1	585	11.5	
29–35	431	7.1	1325	9.7	3426	6.9	4297	7.2	4718	8.8	468	9.2	

a. Conditional response rate based on the subsample of SHOT 2022 participants who were invited to the follow-up study.

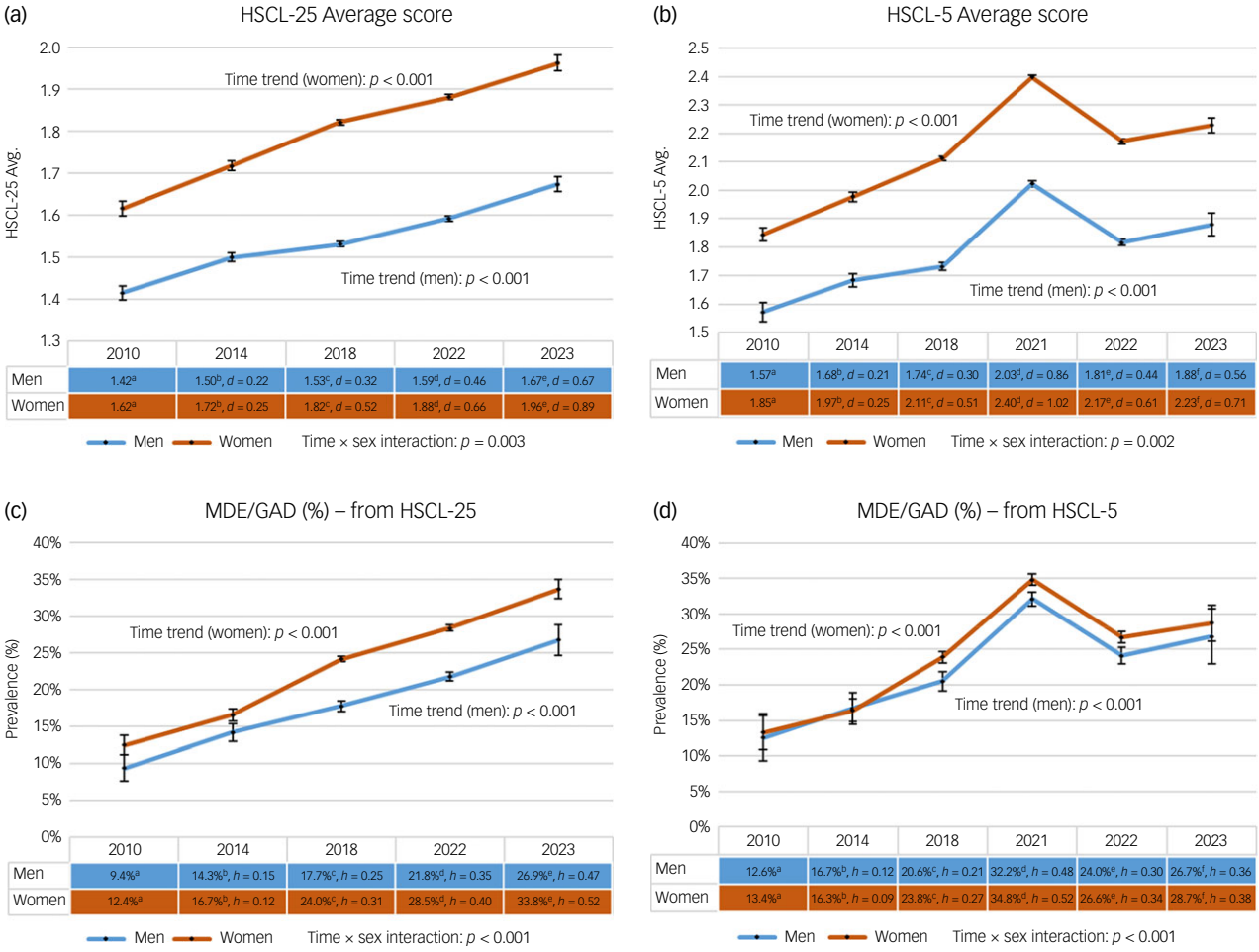

Fig. 1 Temporal trends in mental health indicators from 2010 to 2023 in the Students' Health and Wellbeing Study (SHOT). The top panels display continuous scores from the Hopkins Symptom Checklist (HSCL-25, panel a), except for 2021 where the HSCL-5 was used (panel b). The 2021 data point thus reflects an additional time point captured during the COVID-19 lockdown. The bottom panels depict the corresponding estimated prevalence of a major depressive episode (MDE) and generalised anxiety disorder (GAD) based on sex-specific cut-offs for HSCL-25 (panel c) and HSCL-5 (panel d). Error bars indicate 95% confidence intervals. Superscript letters mark statistically significant differences across survey years within the same sex group, with each letter corresponding to a specific SHOT survey wave. For instance, (a) serves as the baseline, with (b), (c), (d) and (e) indicating significant changes from this baseline in later years; *d*/*h* refers to Cohen's *d* (for means) and Cohen's *h* (for proportions), compared to the 2010 data.

for recent suicide attempts (panel f). The pattern for lifetime suicidal thoughts showed a similar increase among both sexes, rising from 22.7% in 2018 to 24.3% in 2022 among women, and from 18.4% to 19.4% among men (panel g). For recent suicidal thoughts, there was a steady increase from 2018 to 2022 for both women (7.4 to 9.1%) and men (6.7 to 7.5%; panel h).

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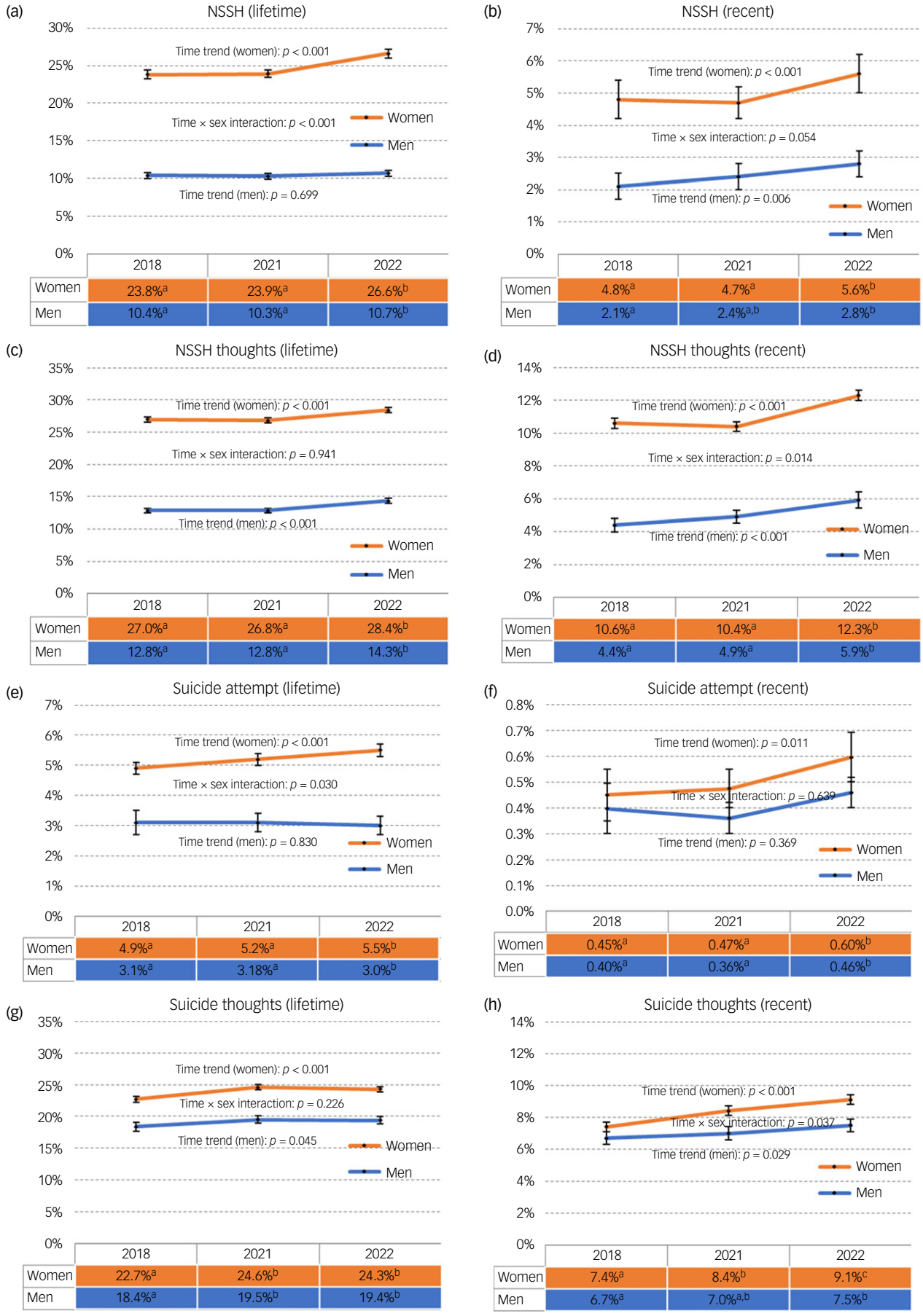

Fig. 2 Temporal trends in lifetime and recent (past year) suicidal history from 2018 to 2022 in the Students' Health and Wellbeing Study (SHOT). Error bars denote 95% confidence intervals. Superscript letters next to percentage values indicate statistical significance across different years for the same sex group.

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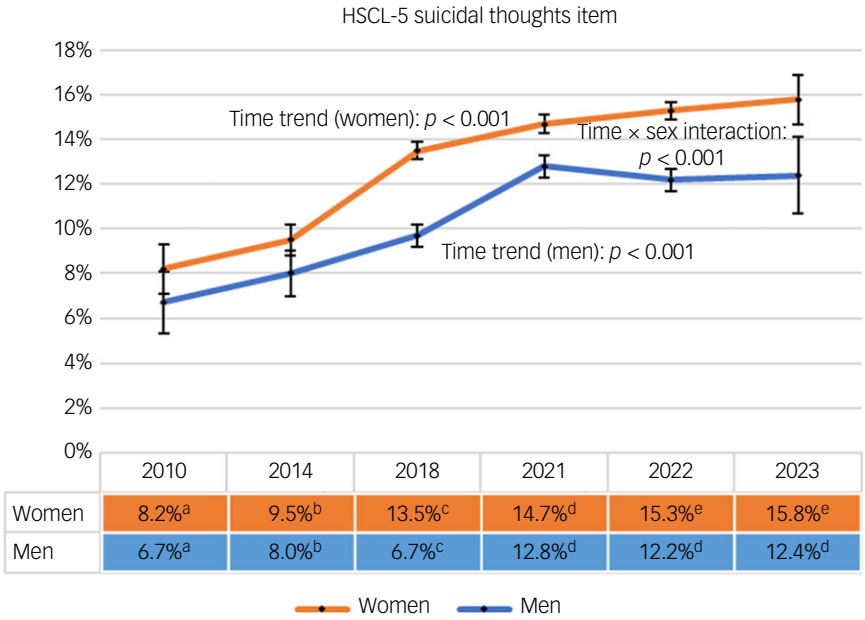

Fig. 3 Temporal trends in suicidal thoughts from 2018 to 2023 in the Students' Health and Wellbeing Study (SHOT), displaying the proportion of respondents reporting 'Quite a bit' or 'Extremely' on the Hopkins Symptom Checklist (HSCL). Error bars represent 95% confidence intervals. Superscript letters next to percentage values indicate statistical significance across different years for the same sex group.

Long-term trends in suicidal ideation from 2010 to 2023

Figure 3 illustrates the changes in suicidal thoughts from 2010 to 2023, based on the HSCL item for suicidal ideation. Both men and women exhibited a statistically significant increase in the proportion of respondents reporting suicidal thoughts as 'quite a bit' or 'extremely' over time, and no decline after the 2021 lockdown. Among women, the prevalence steadily rose from 8.2% in 2010 to 15.8% in 2023. For men, suicidal ideation increased from 6.7% in 2010 to 12.8% in 2018, with no further significant change observed in subsequent years. The significant time × sex interaction indicates that the rise in suicidal thoughts was more pronounced among women compared to men over the study period.

Sensitivity analyses

The odds of meeting criteria for mental health problems increased significantly across each survey wave, with findings consistent across both cut-off approaches and measurement tools (HSCL-25 and HSCL-5; see Supplementary Table 1 available at https://doi.org/10.1192/bjp.2025.10435). While the overall pattern remained the same, the estimated age- and sex-adjusted odds ratios were generally higher when applying the newer sex-specific thresholds compared to traditional cut-offs. For example, using HSCL-25 in 2022, students had 3.56 times higher odds of meeting criteria for mental health problems compared to 2010 with sex-specific cut-offs (95% CI: 3.22–3.93), versus 3.24 times higher odds with traditional cut-offs (95% CI: 2.98–3.51). Similarly, analyses using HSCL-5 revealed higher odds ratios for the sex-specific cut-offs (odds ratio 2.31, 95% CI: 2.14–2.50) compared to the traditional cut-off (odds ratio 2.11, 95% CI: 1.98–2.24) for the same year. This consistent trend underscores the robustness of findings irrespective of the measure and cut-off approach used.

Discussion

This study examined mental health trends among Norwegian students from 2010 to 2023, revealing a marked increase in psychological distress and suicidal ideation, especially among female students. HSCL scores rose steadily across the 13-year period, peaking during the 2021 COVID-19 lockdown (based on HSCL-5, as the full HSCL-25 was not used in that wave). Although there was some decline by 2022, symptom levels in 2023 remained higher than pre-pandemic levels. The estimated prevalence of possible MDE and GAD also increased, with larger absolute increases among women (from 12.5 to 33.7%) and proportionally greater increases among men (from 9.4 to 26.8%). Consistent with other COVID-era studies, suicidal ideation rose early in the pandemic and remained stable throughout the restriction period. The post-lockdown increase in self-harm and suicidal ideation, particularly among women, likely reflects the rise in mental health problems and challenges some students faced in readjusting to post-pandemic life.[28,29]

Although our focus is on students, broader trends among young adults show similar increases in mental health problems.[30,31] While mental disorders commonly emerge in early adulthood,[32] students may face unique stressors, such as academic pressure, financial insecurity and social disconnection.[33,34] Our findings align with a growing body of literature that documents increasing mental health problems among students in higher education over the past two decades. Numerous studies from the USA, Europe, and other parts of the world have shown a similar upward trajectory in reported levels of anxiety, depression and other psychological distress among students.[6] For instance, a comprehensive review by Duffy et al[35] highlighted substantial increases in depressive symptoms and suicidal ideation among USA college students between 2009 and 2019, paralleling our findings in the SHOT study. Similarly, recent evidence from the Canadian U-Flourish study,[12] which employed a longitudinal design following students across time and recruiting successive cohorts annually, has demonstrated sustained mental health burdens among university students, including post-pandemic trends. While differing in methodology from our repeated cross-sectional approach, the convergence of findings across these designs strengthens the validity of the observed trends.

A unique contribution of our study is the analysis of post-pandemic mental health and suicidality, particularly the

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persistently high prevalence of suicidal thoughts observed even after the COVID-19 lockdown. This contrasts with early pandemic studies, which documented an immediate but short-term rise in both mental health problems[36] and suicidality[37] during the pandemic, and it expands on previous studies showing an increase in suicidal ideation and suicide attempts in the general adult population both before and during the COVID-19 pandemic. Our findings are consistent with research suggesting that prolonged isolation and the challenges of returning to regular routines contributed to sustained mental health concerns after the acute phase of the pandemic.[29]

The rising prevalence of mental health problems likely reflects multiple contributing factors. Although it is beyond the scope of this study to fully unpack these causes, some have suggested that declining stigma may have increased students' willingness to report psychological distress.[38] Mental health is now more openly discussed,[39] and attitudes towards help-seeking among students have become more positive.[40] However, if reporting bias or reduced stigma were the primary explanation, we would expect increases to be more pronounced in subjective symptoms such as sadness and worry, which are particularly sensitive to changing social norms. In contrast, behaviours such as NSSH and suicide attempts remain highly stigmatised, are typically underreported and are less likely to be influenced by shifts in disclosure norms. The fact that these behaviours have also increased over time suggests that broader psychosocial or structural factors, beyond reporting artefacts, may be contributing to the observed trends. This interpretation is further supported by our findings and USA longitudinal data,[35,41] both of which show parallel increases in symptom reporting and self-harming behaviours. Moreover, UK trend data from 2009 to 2019 found little evidence that reduced stigma alone accounts for the rise in self-reported mental health problems.[42]

Several structural factors may also play a role. The expansion of higher education in Norway, reaching 37.9% of adults in 2024, up from 34.6% in 2019,[43] has also increased the diversity of the student population, offering broader educational opportunities while potentially including more individuals from non-traditional and underrepresented backgrounds who may experience greater academic and psychosocial vulnerability.[44] Moreover, the cost-of-living crisis, increased academic competition and climate-related anxiety have emerged as relevant stressors, all of which may disproportionately affect young adults.[3] Finally, despite growing awareness and efforts to normalise help-seeking, stigma remains a persistent barrier to accessing care.[16] These individual, structural and attitudinal challenges underscore the need for integrated and tiered mental health support systems in higher education.[45,46]

The pandemic also accelerated the shift towards digital learning environments, which, while providing educational continuity, may also have contributed to increased isolation and reduced peer engagement.[47] Evidence from SHOT and other studies suggests that human connectedness is critical to student wellbeing.[11,14] Future strategies should balance digital convenience with in-person engagement and cultivate inclusive, supportive campus environments.

The public health and educational implications of these findings are substantial. Institutions must ensure access to mental health services while investing in universal and targeted prevention efforts. Interventions that foster peer support, social belonging and financial stability are essential. Structural measures, such as expanding student grants, subsidised housing and promoting physical activity, could help reduce the mental health risk.[2] Providing structured transition support for first-year students and prioritising on-campus teaching formats may also offer protective effects.

From a methodological perspective, limitations include relatively modest response rates and limited non-responder data. Participation ranged from 22.6% in 2010 to 35.1% in 2022. While non-participants often report worse health, response may also be influenced by topic relevance.[48] The increasing rates could reflect heightened concern about mental health, potentially affecting sample composition. However, age and sex distributions between responders and non-responders in recent waves were similar, and regional variation was limited, suggesting acceptable representativeness. Additionally, mental health surveys may be affected by contextual framing. A meta-analysis[49] showed that occupational studies often report higher distress levels, possibly due to greater topic salience. Similarly, mental health-focused student surveys may influence symptom reporting, possibly inflating prevalence estimates. While this may affect absolute rates, the potential impact on observed trends over time is less clear. Finally, the 2021 survey used the abbreviated HSCL-5 rather than the full HSCL-25, which may limit direct comparability with other waves in terms of symptom severity.

In conclusion, this study provides robust evidence of increasing mental health problems among Norwegian students from 2010 to 2023. While symptom levels peaked during the pandemic, the overall trajectory suggests broader systemic and structural pressures. Meaningfully addressing student mental health will require sustained attention, long-term investment and interventions that extend beyond awareness campaigns and individual-level approaches.

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Supplementary material

The supplementary material is available online at https://doi.org/10.1192/bjp.2025.10435

Data availability

Norwegian data protection regulations and GDPR impose restrictions on sharing individual participant data. However, researchers may request access to survey participant data by contacting the publication committee (borge.sivertsen@fhi.no). Approval from the Norwegian Regional Committee for Medical and Health Research Ethics (https://helseforskning.etikkom.no) is required for access to the data. The dataset is administered by the Norwegian Institute of Public Health, and guidelines for data access can be found at https://www.fhi.no/en/more/access-to-data.

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Author contributions

B.S. is the guarantor of the study. B.S. and K.-J.L. contributed to the initiation, planning, and design of the SHOT data collections. B.S. conducted the statistical analyses on the survey data, carried out the literature review and led the writing of the manuscript. All authors

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contributed with input on the design and analytical plan, interpretation of results, writing of the first draft and critical revision of the manuscript and analyses. All authors approved the final manuscript for submission.

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Declaration of interest

None.

Ethical Standards

All procedures involving human subjects/patients were approved by the Regional Committee for Medical and Health Research Ethics in Western Norway (SHOT 2018: no. 2017/1176, SHOT 2021: no. 176205 and SHOT 2022/2023: no. 326437, respectively). Approvals for conducting the SHOT 2010 and SHOT 2014 studies were granted by the Data Protection Officer for research at the Norwegian Centre for Research Data. Electronic informed consent was obtained after a complete description of the study to the participants.

Transparency declaration

The manuscript is an honest, accurate and transparent account of the study. No important aspects of the study have been omitted, and all discrepancies from the original study plan have been explained.

Analytic code availability

The analytic code supporting the findings is available to other researchers and can be accessed by contacting the first author (B.S.).

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