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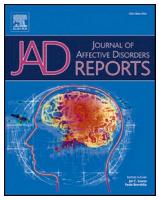

Research Paper

Psychological distress and suicidal ideation in Sicilian Medical Students: The SMS-ME project

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ABSTRACT

Background: Medical students are at high risk for mental disorders, and the COVID-19 pandemic might have exacerbated psychological distress. However, no data are available for the southern part of Italy. The SMS-ME (Sicilian Medical Students' MEntal health) project aimed to estimate the prevalence of and predictors of depression, anxiety, stress, and suicidal ideation in a sample of Sicilian medical students.

Methods: A web-based cross-sectional survey was carried out from September 2022 to December 2022. The study protocol investigated sociodemographic factors and clinical data including Depression, Anxiety, Stress Scale-21 (DASS-21), and a specific question addressing suicidal ideation frequency over the last six months. Multivariate regression models were assessed to examine the association between symptoms and relevant predictors and then regressed their residuals with suicidal thought frequency.

Result: We collected 1,866 records (age=22.5, SD=3.4; 65.2 % females). One out of four students presented highly severe depression (25 %) and referred to the presence of some suicidal ideation in the six months preceding the interview (26.1 %). DASS-21 scores, especially depression ($F(5, 1{,}828)=58.8$, $p = 6.59^{-57}$), increasingly predicted the frequency of suicidal thoughts when above the sample's mean.

Limitations: The cross-sectional study design does not allow inferences on temporal relationships and the self-report strategy could be intrinsically biased by the person's feelings at the time of the interview.

Conclusions: High prevalence of anxiety and depressive symptoms and suicidal thoughts were observed among Sicilian medical students. The DASS-21 was a good predictor for suicidal ideation that Universities could use as a simple tool to assess the need for psychological healthcare in this population.

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1. Introduction

The World Health Organization (WHO) estimates that nearly one billion people worldwide live with a mental disorder (Freeman, 2022) and that every 40 s, a person commits suicide (World Health Organization (WHO), 2019). Mental disorders have significant social and economic impacts on populations (Bland et al., 2012). Unfortunately, numbers rose radically because of the impact of the COVID-19 pandemic (Mackin et al., 2019). Several studies emphasized that higher education is associated with an increased risk of depressive and anxiety symptoms, as well as suicidal ideation (Adams et al., 2021; Bland et al., 2012; Karyotaki et al., 2020; Mackin et al., 2019; Storrie et al., 2010). According to a WHO study, 35 % of university students suffer from mental disorders or related health problems, and some groups may be more at risk than others (Auerbach et al., 2018). Compared to other academic fields, medical students are more likely to present with anxiety and depressive symptoms (Mittal et al., 2021; Moir et al., 2018; Rotenstein et al., 2016; Tian-Ci Quek et al., 2019). This issue could be due to a long and competitive study course, compounded by additional challenges such as stress from the clinical environment and an overwhelming workload (Sreeramareddy et al., 2007). Some authors suggested that medical students highly aspire for excellence and are prone to competitiveness, affecting their well-being (Lohse et al., 2017). Indeed, several studies and meta-analyses highlighted an alarming prevalence of anxiety, depressive symptoms, and suicidal thoughts in this population (Dar et al., 2022; Fekih-Romdhane et al., 2021; Puthran et al., 2016; Rotenstein et al., 2016; Tarchi et al., 2021; Tian-Ci Quek et al., 2019). Previous studies on the mental health of Italian medical students focused on northern and central Italy regions. Bertani et al. (Bertani et al., 2020) examined the presence of anxiety and depressive symptoms in students attending the medical school of the University of Modena and Reggio Emilia. One out of five students presented anxiety; 7 % of the sample experienced depressive symptoms (Bertani et al., 2020), exceeding the national prevalence of 4.6 % in the age group 18–34 over the same time (Epicentro, 2024). Tarchi et al. (Tarchi et al., 2021) compared suicides committed by medical students to those committed by peers in the general population that occurred in Pavia between 2014 and 2019. They found an odds ratio of almost 15 for suicide among medical students in comparison to the general population. A large prospective study on 1388 Italian students, followed up after six months, highlighted that severe mental health problems among students reached worrying levels (Meda et al., 2023). The study, using a machine-learning approach, found the largest effect size for the association between suicidal ideation and the severity of depression, with suicidal ideation increasing the likelihood of severe depression symptoms by approximately nine times. Interestingly, they reported that the field of study was among the factors predicting changes in depressive symptoms.

Finally, studies conducted during the COVID-19 pandemic in Northern Italian reported worrying levels of depression and suicidal ideation in university students (Meda et al., 2023, 2021). Social distancing measures, university closures, and the shift to distance learning during the pandemic may have exacerbated social isolation, loneliness, hopelessness, and distress (Patrono et al., 2022). Moreover, postponing internships at healthcare facilities, which are crucial for professional development, could have affected career advancement plans (Schnoes et al., 2018).

To date, data on students from Southern Italy are still unavailable. Sicily is the largest region in Italy and the 5th largest in population, with almost 5 million inhabitants (Istat, 2022). With a poverty risk rate of 38 %, the island ranks among the most distressed regions in the country (Istat, 2021). It has unique cultural, social, and economic characteristics that may influence its population's prevalence and experience of psychological distress. Thus, it could deserve specific monitoring. In a training program aimed at safeguarding the well-being of future patients, it is imperative to equip students to take care of their own mental and physical wellness, as this can profoundly affect the quality of care and safety provided to their patients.

The SMS-ME (Sicilian Medical Students' MEntal health) project aimed to estimate the prevalence of depression, anxiety, stress, and suicidal ideation in a sample of Sicilian medical students.

Secondly, the study investigated crucial predictors of the contest of the pandemic period with its specific influence. The final aim of the study was to identify which support students needed from the university to set proper answers to their disease.

2. Material and methods

A survey was conducted from September 2022 to December 2022 among Sicilian Medical school students. The 6-year degree course in Medicine and Surgery in Sicily is offered by three public institutions: the University of Palermo, with 2372 students enrolled in Palermo and 628 students in Caltanissetta, a branch campus of the University of Palermo; the University of Catania with 2083 students; and the University of Messina, with 2020 students. These universities not only cater to the most populated areas of the island (59.7 % of the Sicilian population) but also attract students from neighbouring provinces.

The study was approved by the Ethics Committee of Reference of the University Hospital "Paolo Giaccone" of Palermo under reference 107/2022 on the 29th of September 2022. All participants provided digital informed consent; data were collected anonymously, stored, and processed in compliance with the General Data Protection Regulation governance framework.

2.1. The survey

An *ad hoc* questionnaire consisting of 19 items included five sections: 1) Socio-demographic and university career details; 2) Experience with COVID-19; 3) Post-pandemic effects on students' attitude towards studying; 4) Strategies implemented by students to cope with stress related to the COVID-19 pandemic; 5) Strategies the university could adopt to improve students' mental health (supplementary material).

The questionnaire was accessed via a dedicated link and QR code created on the Google Forms® platform, providing reserved access available 24/7. It was entirely anonymous. Student representatives and researchers presented the project in each class, where students could ask questions and fill in the questionnaire. It was also accessible through various online medical school platforms and social networks.

2.2. Instruments

The SMS-ME project included the Work Self-Efficacy Scale (WSES) (Avallone et al., 2007), assessing perceived future work capability, and two instruments to investigate students' mental health: the Depression, Anxiety, Stress Scale - Short Version (DASS-21) (Lovibond and Lovibond, 1996) to investigate stress, depression and anxiety, and the Eating Attitude Test – 26 items (EAT-26) (Garner et al., 1982) to investigate whether students might have an eating disorder that needs professional attention.

For the aim of this study, we selected the Italian version of the DASS-21 (Alim et al., 2017; Bottesi et al., 2015; Henry and Crawford, 2005; Lan et al., 2020), a 21-item self-report scale assessing general distress derived from the 42-item version (Lovibond and Lovibond, 1996) and referring to the last week. It comprehends three scales: Depression, Anxiety, and Stress. The factorial structure of the test provides seven items investigating depression (lack of incentive, low self-esteem, and dysphoria), seven items assessing anxiety (somatic and subjective symptoms and acute responses to fear), and seven items revealing stress levels (persistent arousal, tension, impatience, and irritability). Depression, anxiety, and stress scores are calculated by summing the scores of the relevant items. Subscale totals are categorised into normal, mild, moderate, severe, and extreme (*Depression Subscale* - Normal: 0–9; Mild: 10–13; Moderate: 14–20; Severe: 21–27; Extremely Severe: 28+.

Anxiety Subscale - Normal: 0–7; Mild: 8–9; Moderate: 10–14; Severe: 15–19; Extremely Severe: 20+. *Stress Subscale* - Normal: 0–14; Mild: 15–18; Moderate: 19–25; Severe: 26–33; Extremely Severe: 34+). Because the DASS-21 is a short-form version of the DASS (Depression Anxiety Stress Scales) (42 items), the final score for each sub-scale is multiplied by two and evaluated according to its severity rating index. Cronbach's α in a community sample was 0.74 for anxiety, 0.82 for depression, and 0.85 for stress (Bottesi et al., 2015).

The answer to the behavioural question included in the EAT-26, a highly sensitive tool for detecting potential eating disorders and assessing suicidal thoughts among the respondents through a Likert scale investigating the frequency within the past six months, was used (ranging from 1 = "Never", 2 = "Once to several times a month", 3 = "Once a week", 4 = "Two to six times a week", 5 = "Once a day", 6 = "More than once a day") (Garner et al., 1982).

2.3. Statistical analysis

A summary Student's *t*-test was used to compare the scores from DASS-21 of the sample with those of the normative sample (Bottesi et al., 2015; Loscalzo and Giannini, 2022).

Cronbach's alpha determined the internal consistency of the questionnaire and its factors. A multivariate general linear model was conducted, with DASS scores for stress, anxiety, and depression as the outcomes and the abovementioned ad hoc questions as predictors. Notably, the model was carefully controlled for sex, age, and city of recruitment, ensuring a comprehensive analysis.

The Variance Inflation Factor (VIF), a measure of multicollinearity among independent variables, was used. In line with a conservative approach, a VIF of 2.5 or above between two or more predictors indicates the presence of multicollinearity, a condition that can affect the reliability of the model. Results were reported in terms of unstandardised beta (b) and its relative 95 % confidence interval (CI 95 %), Bonferroni adjusted, and further controlled for family-wise error by Benjamin-Hochberg procedure (Benjamini and Hochberg, 1995; Bonferroni, 1936).

Furthermore, residuals of depression, anxiety, and stress obtained from the previously described multivariate regression were employed as independent variables in three independent UNIANOVA analyses to see if they predicted the frequency of suicidal thoughts.

The IBM Statistical Product and Service Solutions (SPSS) software (version. 28, IBM Inc., USA) served as the statistical package for all the analyses.

3. Results

3.1. Sociodemographic and academic characteristics

Between September and December 2022, 1866 students (65.2 % female) aged 22.5 (SD=3.4) completed the questionnaire (29.2 % Overall Response Rate on the pool of students enrolled in the four cities: Caltanissetta RR=43.3 %; Catania RR=18.5 %; Messina RR=27.5 %; Palermo RR=27.6 %). Among responders, 35 % were from Palermo, 14 % from Caltanissetta, 29.7 % from Messina, and 20.6 % from Catania. 50 % of the sample attended the first three years of the course (pre-clinical studies) and 50 % the last three years (clinical studies). Nearly all respondents were full-time students (95.6 %), and 92.3 % reported regularly attending classes. Regarding their curricular internship, 30 % of students had performed it in place during the previous academic year (2021/2022), 26 % partly on-site and partly remotely, 2.5 % entirely remotely, while 41.2 % had not performed any internship, mainly because they were still attending the pre-clinical studies. 60.9 % were off-site students, although, among the total number of respondents, most lived with their families (47.3 %) or roommates (46.5 %), and only 4.4 % alone. Over half reported having one room available, 26 % the entire house, 16 % a portion of it, and 5.3 % shared the room. Over half had been diagnosed with COVID-19 at least once during the pandemic, and 6.3 % more than once. 28.9 % reported having experienced post-COVID cognitive syndrome, and 13.1 % persisting symptoms (Supplementary Table 1).

3.2. Perception of changes in the attitude towards studying during the pandemic

34.5 % of students reported negative changes in their attitude towards studying, 20.7 % positive changes, and 44.7 % experienced no changes in the last year. 56.8 % felt negative changes in the interactions with colleagues and professors during remote learning, 12.3 % a positive change, and 30.9 % experienced no changes. 20.8 % felt their performance during online evaluations was negatively affected compared to their usual performance, 17.3 % felt a positive change, and 61.8 % observed no changes. Lastly, among those who performed the internship, 48 % of students felt that modifications of the internships due to the pandemic harmed their training, 14 % experienced a positive impact, and 38.1 % noticed no changes (Supplementary Table 2).

3.3. Students coping strategies during the pandemic

Students' coping strategies during the pandemic were diverse. 65.4 % of the students found engaging in activities at home (e.g., indoor workouts, use of music streaming platforms or movies and TV series, cooking, video games, reading) helpful to overcome periods of increased stress. 43.5 % preferred outdoor sports and social activities, 19.9 % used nootropic food supplements, drugs or other substances, and the remaining 12.2 % did not implement any of these coping strategies (Supplementary Table 3).

3.4. Students preferred university preventive/intervention strategies

The enhancement of tutoring/psychological support services (67.9 %) and the availability of health/wellness spaces shared with colleagues and professors (62.2 %) were the most frequently chosen preventive and intervention strategies students want the University to provide to enforce their mental health. At least half of the students also desired increasing internships and other practical activities (50.5 %), providing training in psychological self-assessment (47 %), and developing a mobile application (app) that could help in psychological self-monitoring and put them in direct contact with the mental health system (54.5 %) (Supplementary Table 4).

3.5. DASS scores

Mean scores (Table 1) for stress (Mean diff = 0.6, $t = 2.2$, df = 2259, $p = 0.025$), anxiety (Mean diff = 3.3, $t = 11.9$, df = 2259, $p < 0.001$) and depression (Mean diff = 1.3, $t = 4.4$, df = 2259, $p < 0.001$) were higher compared with a similar study conducted in central Italy during the pandemic on 395 medical students (Loscalzo and Giannini, 2022) and

Table 1
Mean scores and reliability of DASS_21.

	N	Mean	SD	Summary *t*-test*	Cronbach's alpha
Stress	1866	11.2	4.7	Mean diff = 1.3, $t = 4.4$, df = 2259, $p < 0.001$	0.861 (7 items)
Anxiety	1866	8.2	5.0	Mean diff = 3.3, $t = 11.9$, df = 2259, $p < 0.001$	0.855 (7 items)
Depression	1866	9.2	5.4	Mean diff = 0.6, $t = 2.2$, df = 2259, $p = 0.025$	0.891 (7 items)
TOT	1866	28.7	13.7		0.941 (21 items)

* Comparisons with Loscalzo and Giannini (2022).

the general population (Bottesi et al., 2015).

Scores from severe to extremely severe were revealed in 33 % of students for stress, 53 % for anxiety, and 40 % for depression (Fig. 1).

Stress was higher in females (β = 3.8, CI 95 % = 2.9, 4.6, $p = 6.1^{-17}$), in part-time students (β = 2.3, CI 95 % = 0.2, 4.4, $p = 0.031$), and in those who perceived a negative impact on their study during the pandemic (β = 2.7, CI 95 % = 1.8, 3.6, $p = 2.7^{-9}$). Students with higher stress scores reported having used drugs and nootropic food supplements during the pandemic period (β = 3.8, CI 95 % = 2.7, 4.9, $p = 5.6^{-12}$) and not having exercised or done any outdoor activities (β = −1.7, CI 95 % = −2.7, −0.8, $p = 0.0002$) to cope with their negative emotions. When we asked students what the university could arrange to improve their wellness, those with higher stress scores desired an enhancement of the tutoring/psychological support university services (β = 1.0, CI 95 % = 0.1, 1.9, $p = 0.030$), and the implementation of an APP to self-monitor their mental health (β = 1.2, CI 95 % = 0.4, 2.1, $p = 0.004$). They were less interested in additional internship hours (β = −0.9, CI 95 % = −1.6, −0.03, $p = 0.040$) (Fig. 2).

Anxiety was higher in females (β = 4.1, CI 95 % = 3.1, 5.1, $p = 1.4^{-17}$) and in those enrolled in the clinical part of the training (β = 1.7, CI 95 % = 0.05, 3.4, $p = 0.043$). Students who perceived a negative impact on their study (β = 2.5, CI 95 % = 1.6, 3.5, $p = 1.1^{-7}$) and evaluations (β = 2.5, CI 95 % = 1.6, 3.5, $p = 0.042$) during the pandemic were more anxious than those who did not. Students with higher anxiety scores reported having used drugs and nootropic food supplements (β = 4.7, CI 95 % = 3.6, 5.9, $p = 7.9^{-16}$) and not having exercised or done any indoor activities (β = −1.9, CI 95 % = −3.1, −0.7, $p = 0.001$) or outdoor activities (β = −2.0, CI 95 % = - 3.0, −1.0,$p = 0.00008$) during the pandemic to cope with their negative emotions. Students with high anxiety scores desired an enhancement of the tutoring/psychological support university services (β = 1.1, CI 95 % = 0.1, 2.1, $p = 0.028$) and the implementation of an APP to self-monitor their mental health (β = 1.6, CI 95 % = 0.7, 2.5, $p = 0.0005$). They were less interested in having additional internship hours (β = −1.2, CI 95 % = −2.1, −0.3, $p = 0.005$) (Fig. 3). Anxiety was higher in those who pursued fewer credits (β = −0.01, CI 95 % −0.02 −0.006, $p = 0.0009$) – not shown in the figure.

Depression was higher in females (β = 2.1, CI 95 % = 1.1, 3.1, $p = 0.00002$) enrolled in the clinical part of their studentship (β = 3.5, CI 95 % = 1.8, 5.3, $p = 0.00007$). Students with higher depression scores reported to do not following classes regularly (β = −2.7, CI 95 % = −4.6, −0.8, $p = 0.005$). Depression was also higher in those who perceived a negative impact on their study during the pandemic (β = 4.9, CI 95 % = 3.9, 5.9, $p = 1.1^{-21}$). Students with higher depression scores reported having used drugs and nootropic food supplements (β = 4.0, CI 95 % = 2.8, 5.2, $p = 6.7^{-11}$) and not having engaged in outdoor activities (β = −2.4, CI 95 % = −3.4, −1.3, $p = 0.000005$) during the pandemic to cope with their negative emotions. Students with high depression scores desired an enhancement of the tutoring/psychological support university services (β = 1.6, CI 95 % = 0.6, 2.6, $p = 0.003$). They were less interested in sharing places with colleagues and teachers to meet and improve their wellness (β = −1.2, CI 95 % = −2.2, −0.3, $p = 0.009$) (Fig. 4). Depression was also higher in those who pursued fewer credits (β = −0.02, CI 95 % −0.03 −0.01, $p = 7.9^{-7}$) – not shown in the figure.

3.6. Suicidal thoughts

Two hundred and forty-five students reported having thought about suicide "one or more times a month" (13.1 %), 103 "once a week" (5.5 %), 80 "two to six times a week" (4.2 %), 39 "once a day" (2 %) and 26 "more than once a day" (1.3 %), in the six months preceding the interview (Supplementary Figure 1). Adjusted residual scores for stress (F (5, 1828) = 29.1, $p = 1.35^{-28}$), anxiety (F (5, 1828) = 27.3, $p = 9.03^{-27}$), and depression (F (5, 1828) = 58.8, $p = 6.59^{-57}$), increasingly predicted suicidal thoughts, when above the sample mean, with a higher significance for depression (Fig. 5, Supplementary Figure 2).

4. Discussions

4.1. Main findings

We found higher levels of stress, anxiety and depression among Sicilian students compared to both the normative reference population (Bottesi et al., 2015) and other studies conducted on similar populations during the pre-pandemic, pandemic, and post-pandemic period (Bertani et al., 2020; Bottesi et al., 2015; Carletto et al., 2022; Mazza et al., 2020; Rotenstein et al., 2016; Tian-Ci Quek et al., 2019). The most striking result is that >25 % of students presented highly severe depression and reported the presence of some suicidal ideation in the six months preceding the interview. Also, we found an association between suicidal thoughts and the three DASS-21 factors, adjusting for several confounders. This finding could help prevent and manage individuals at risk in this population.

We also evaluated what students struggling with mental health needed from the University. Students experiencing significant psychological distress desired improved tutoring and psychological support services. They would also benefit from a self-monitoring app for psychological well-being and guidance towards accessing healthcare professionals.

4.2. Comparison with previous literature

Previous meta-analyses reported a higher prevalence of anxiety (33.8 %), suicidal ideation (11.1 %) (Tian-Ci Quek et al., 2019), and depressive symptoms (28 %) (Puthran et al., 2016; Rotenstein et al., 2016) compared to young adults aged 18–34 in Northern Italy (6.7 %) (Epicentro, 2021–2022), and the general population (4.4 %) (World Health Organization (WHO), 2017). In the present study, set up in Southern Italy, it is worth noting that the prevalence of moderate depressive symptoms among medical students is almost doubled (64% vs 28 %), same for the frequency of suicidal ideation (26% vs 11.1 %), and moderate anxiety (73% vs 33.8 %). When compared with other Italian pre-pandemic studies, our rates of "severe" and "extremely severe"

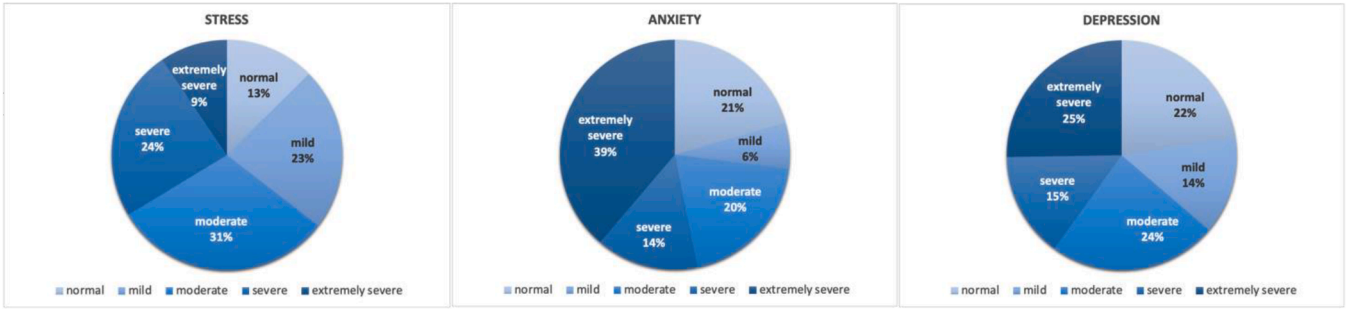

Fig. 1. Pie charts reporting the severity of Stress, Anxiety, and Depression [27].

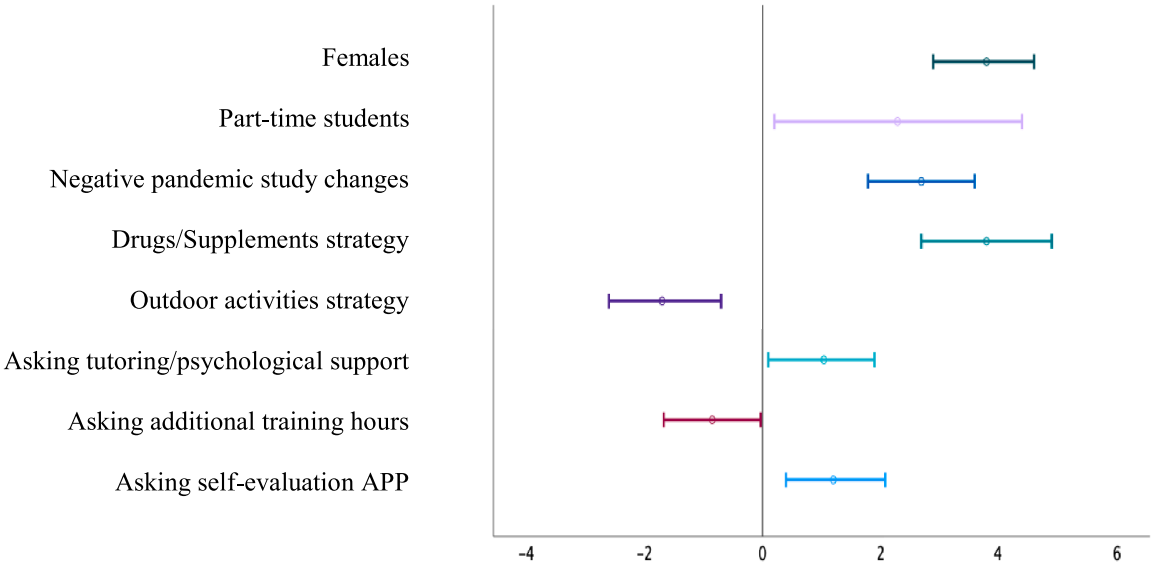

Fig. 2. Significant categorical predictors of Stress.
Legend: the x-axis represents β and CI 95 % for each significant predictor in the y axis.

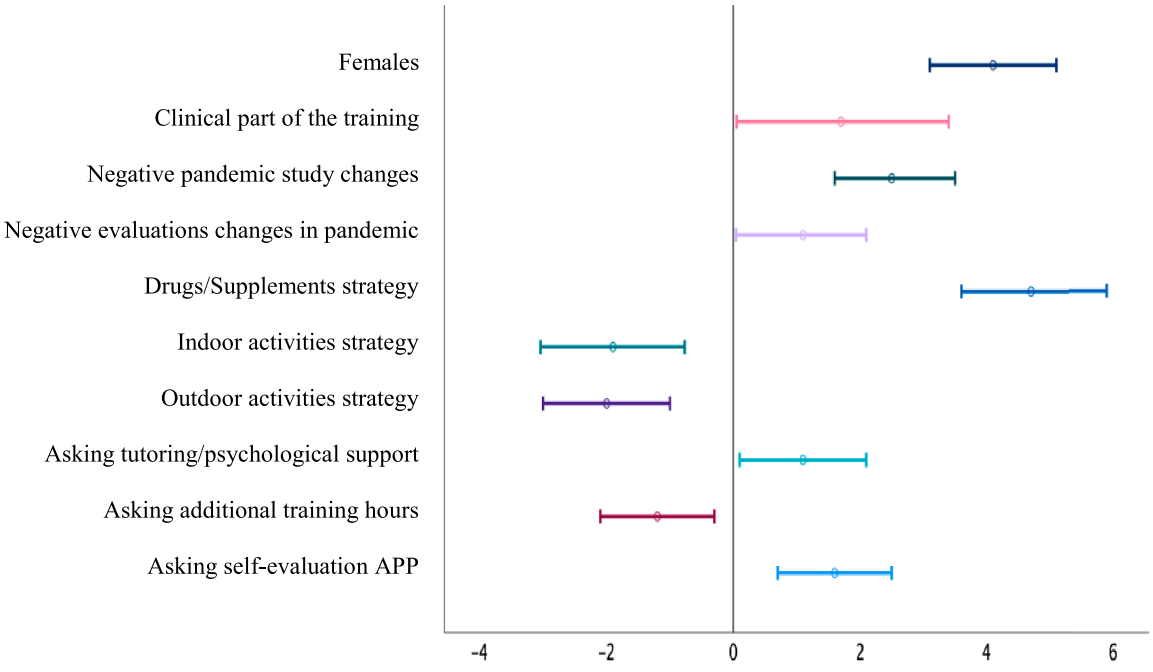

Fig. 3. Significant categorical predictors of Anxiety.
Legend: the x-axis represents β and CI 95 % for each significant predictor in the y axis.

depression (40 %) and anxiety (53 %) were consistently higher (Bertani et al., 2020; Carletto et al., 2022). Thus, the COVID-19 pandemic could have worsened these symptoms among students (Meda et al., 2023, 2021); the closure of university facilities and the transition to distance learning could have disproportionately affected a student population already facing disparities in educational opportunities (Istat, 2021). However, compared with studies conducted in other parts of Italy during the same post-pandemic period (Loscalzo and Giannini, 2022), our pathological scores stayed higher. The varying levels of psychological distress observed across different regions can likely be attributed to socioeconomic differences within the Italian context (Fina et al., 2021). Compared to other European countries, Italy exhibits significant disparities in territory, generation, and citizenship, with the South being particularly disadvantaged. However, other studies set out in Italy reached similar results to ours, suggesting that there is a high prevalence of depression and suicidal ideation among Italian medical students, regardless of their geographical location (North or South). Although Northern and Southern Italy have different socioeconomic conditions, the stressors and pressures inherent in medical training may overshadow regional differences, leading to similar mental health outcomes.

Although Rotenstein et al. (Rotenstein et al., 2016) found medical students to be more likely to engage in active coping by their final year, our study provided evidence of greater depression in students belonging to the clinical three-year period. Carrard et al. (Carrard et al., 2024)

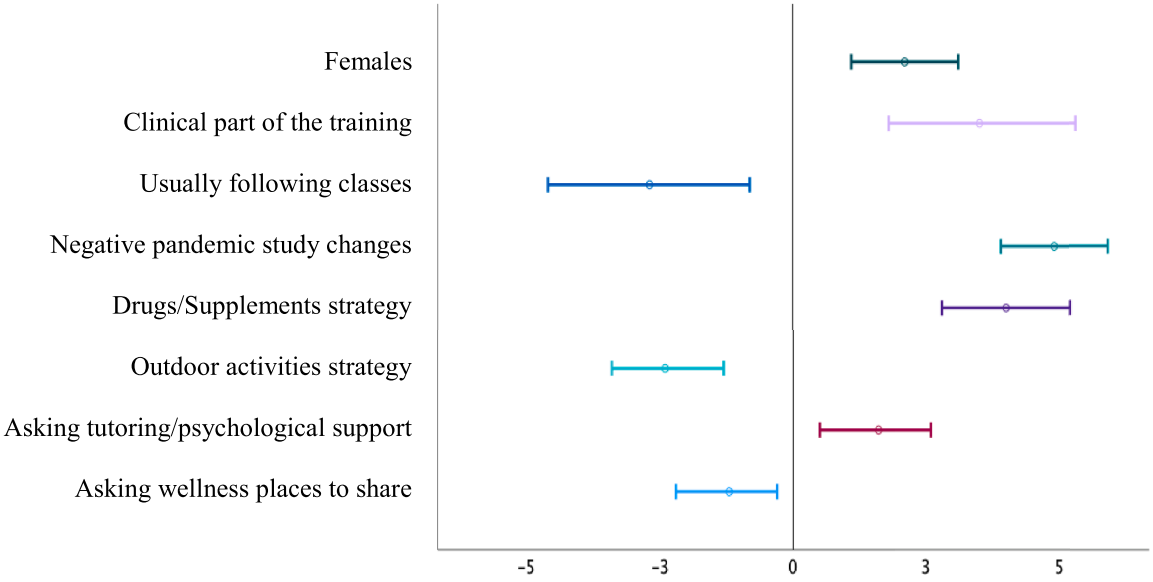

Fig. 4. Significant categorical predictors for Depression.
Legend: the x-axis represents β and CI 95 % for each significant predictor in the y axis.

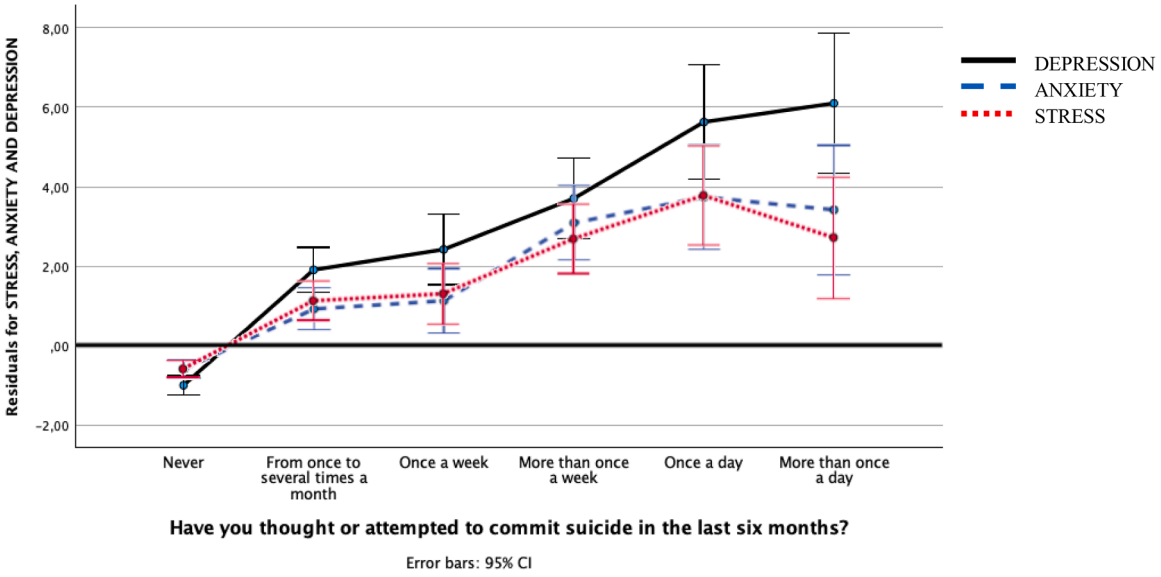

Fig. 5. DASS-21 scores as predictors of the frequency of suicidal ideation.
Legend: the x-axis represents frequency of suicidal though in the last six months, the y-axis represents standardized residuals for depression DASS-21 scores.

conducted a longitudinal study on Swiss medical students, showing that while depression symptoms and stress improved over time, suicidal ideation increased in the final year, and burnout worsened from the beginning to the end of medical school. This suggests that the start and end of medical school bring specific challenges, echoing our findings of higher psychological distress in clinical years.

As highlighted by other studies (Bert et al., 2020; Ragab et al., 2021; Rosal et al., 1997), this finding could be related to the increased pressure and difficulty of the training program, which creates a competitive environment and induces feelings of insecurity and inadequacy (Gilbert et al., 2009). Additionally, the intense study workload and mandatory participation in classes and internships contribute to stress and limit personal time (Slavin, 2016), which further exacerbates psychological distress (Hooper et al., 2010). Indeed, >90 % of respondents were actively following lessons. Psychological distress was higher in those who reported a change in attitude towards studying since the pandemic began, who used drugs and nootropic food supplements, and those who did not adopt coping strategies such as indoor or outdoor activities. Gaume et al. (Gaume et al., 2024) found significant associations between mental health issues (depression, anxiety, and suicidal ideation) and substance use among Swiss medical students, indicating that poorer mental health status correlates with higher substance use risk levels. This is consistent with our observation of higher distress among students using drugs and nootropic supplements.

Luciano et al. (Luciano et al., 2021) remarked that medical students tend to engage in sedentary behaviours, displaying low physical activity levels and suggested that the COVID-19 crisis and subsequent lockdown measures worsened this pattern. In general, students involved in the SMS-ME project expressed a desire for improved shared wellness spaces. However, this preference does not extend to individuals experiencing elevated levels of psychological distress, especially those with elevated depression levels. Therefore, although enhancing shared wellness spaces

might serve as a preventive measure, alternative and more targeted strategies are necessary to support those who are experiencing greater challenges.

Considering the significance of addressing an arising situation, psychologists, psychotherapists, and public health professionals must prioritize this issue by implementing preventive strategies that are both rapid and structured. In accordance with other studies (Frajerman et al., 2019; Porru et al., 2022), these results highlighted the importance of providing a preventive approach to psychological distress in medical students and promoting a culture that destigmatizes psychological distress and empowers students' ability to recognize symptoms and seek help. In fact, medical students who experience depression does not receive adequate treatment, despite the availability of mental health services (Tjia et al., 2005). If confirmed by future research, the results of this study could have significant implications in clinical practice. Prevention interventions based on enhancement protective factors could help decrease suicidal thoughts among medical students, although further research on psychological interventions is still needed. In this perspective, time-limited group therapy (Lenzo et al., 2014) can be considered a valuable tool in clinical practice.

Our study focused only on the mental health of medical students, although speculating about potential differences between medical and non-medical students, especially in the context of similar studies, can be insightful. While non-medical students face their own set of academic pressures, these often differ in nature and intensity from those experienced by medical students. Non-medical fields may not have the same level of constant high-stakes testing, direct responsibility for patient care, or exposure to life-and-death situations (Dyrbye et al., 2006). Non-medical students might have more flexibility and opportunities for work-life balance compared to medical students who often face rigorous schedules, long hours, and extensive clinical duties. This could potentially contribute to lower levels of stress and better overall mental health among non-medical students (Bayram and Bilgel, 2008). The structure of non-medical courses might allow for more social interaction and support networks, which are crucial for mental well-being. Medical students, on the other hand, may experience social isolation due to their demanding schedules. The COVID-19 pandemic has universally affected students across disciplines, but the specific impacts may vary. Non-medical students may have faced different challenges such as adapting to online learning, lack of practical experience, and disruptions in internships, which could have affected their mental health differently than medical students (Browning et al., 2021). Further research should help identify whether the observed high prevalence of depression and suicidal ideation is specific to medical training or part of a broader trend affecting all students. This can also highlight unique risk factors and protective factors within each group.

4.3. Limitations

This study has some limitations. Using self-reporting questionnaires could be subjected to bias, although validated evidence-based psychiatric assessment tools were preferred. Our sample was not homogeneous and showed a relatively low response rate that could have acted the generalizability and representativeness of results. However, it is worth noting that our sample was superior to other studies analysed in the literature in certain aspects (Liu et al., 2020). On the other hand, >90 % of respondents reported regularly attending classes. Thus, the sample highly represented of students actively involved in the university life. Nonetheless, efforts to enhance the generalizability of the findings could still be made by further improving the response rate. While the cross-sectional design restricts our ability to infer temporal relationships between variables, it does provide valuable insights into associations between them. Additionally, we acknowledge the absence of information on the participants' mental health status before the study and the COVID-19 pandemic. These limitations offer opportunities for improvement. Future studies could explore alternative methodologies to integrate self-reporting questionnaires, such as the study of personality traits or emotion regulation skills that could explain individual differences in suicidal thinking and, more generally, in overall mental health (Barberis et al., 2020). Furthermore, consider recruiting a more homogeneous sample, and address the temporal relationships between variables using longitudinal designs. A future goal of the study will be to test the data obtained with a machine learning methodology to increase the clinical utility of the questionnaire, understand factors influencing the mental health of medical students and potentially implement more effective interventions.

5. Conclusions

One-quarter of medical students presented highly severe depression and suicidal ideation. This high prevalence among Italian medical students is likely due to a combination of the inherent pressures of medical education, cultural factors, the exacerbating effects of the COVID-19 pandemic, and insufficient mental health support. Addressing these issues requires a multifaceted approach, including enhanced mental health services, efforts to reduce stigma, and structural changes in medical education to foster a more supportive environment. Prevention strategies, such as psychological services, counselling programs and targeted interventions, could include this assessment and the other crucial predictors to assess situations at risk. According to respondents' needs and preferences, creating a self-assessment and informative App, which could put them in contact with mental health services from the university and their territorial context, could be an innovative and handful way to monitor their mental health and disseminate a cultural change. Additionally, it could strike the stigma of approaching mental health services. Lastly, it would be valuable to increase the offer of psychological support from the university and monitor the effects and long-term efficacy of these services by longitudinal data collection.

CRediT authorship contribution statement

Nicole Bonaccorso: Writing – original draft, Conceptualization. **Giada Tripoli:** Writing – review & editing, Writing – original draft. **Ilaria Vella:** Writing – original draft. **Caterina La Cascia:** Supervision. **Emanuele Amodio:** Methodology. **Eleonora Bongiorno:** Writing – original draft. **Dario Genovese:** Methodology, Formal analysis. **Giuseppe Maniaci:** Writing – original draft. **Martina Sciortino:** Writing – original draft. **Elisa Galatà:** Writing – original draft. **Giorgia Iacono:** Writing – original draft. **Alessandra Romano:** Writing – original draft. **Damiano Guglielmino:** Writing – original draft. **Fabio Seminerio:** Writing – original draft. **Crocettarachele Sartorio:** Writing – original draft. **Alessandra Scaglione:** Writing – original draft. **Maria Catena Silvestri:** Writing – original draft. **Rosa Lo Baido:** Supervision. **Maria Catena Quattropani:** Writing – review & editing. **Maria Rosaria Anna Muscatello:** Supervision. **Carmela Mento:** Writing – review & editing. **Maria Salvina Signorelli:** Writing – review & editing. **Diego Quattrone:** Writing – review & editing. **Francesco Vitale:** Supervision. **Daniele La Barbera:** Supervision. **Claudio Costantino:** Supervision. **Laura Ferraro:** Writing – review & editing, Supervision, Methodology, Formal analysis, Conceptualization.

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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References

Adams, K.L., Saunders, K.E., Keown-Stoneman, C.D.G., Duffy, A.C., 2021. Mental health trajectories in undergraduate students over the first year of university: a longitudinal cohort study. BMJ Open 11, e047393. https://doi.org/10.1136/bmjopen-2020-047393.

Alim, S.M.A.H.M., Kibria, S.M.E., lslam, J., Uddin, Z., Nessa, M., Wahab, A., Lslam, M.K., 2017. Translation of DASS 21 into Bangla and validation among medical students.

Auerbach, R.P., Mortier, P., Bruffaerts, R., Alonso, J., Benjet, C., Cuijpers, P., Demyttenaere, K., Ebert, D.D., Green, J.G., Hasking, P., Murray, E., Nock, M.K., Pinder-Amaker, S., Sampson, N.A., Stein, D.J., Vilagut, G., Zaslavsky, A.M., Kessler, R.C., 2018. WHO world mental health surveys international college student project: prevalence and distribution of mental disorders. J. Abnorm. Psychol. 127, 623–638. https://doi.org/10.1037/abn0000362.

Avallone, F., Pepe, S., Porcelli, R., 2007. Autoefficacia percepita nella ricerca del lavoro: scale di misura. EmIsfol, Bisogni, valori e autoefficacia nellascelta del lavoro. Roma ISFOL 133–142.

Barberis, N., Verrastro, V., Papa, F., Quattropani, M.C., 2020. Suicidal ideation and psychological control in emerging adults: the role of trait EI. Maltrattamento e Abus. All'Infanzia Riv. Interdiscip. https://doi.org/10.3280/MAL2020-002002.

Bayram, N., Bilgel, N., 2008. The prevalence and socio-demographic correlations of depression, anxiety and stress among a group of university students. Soc. Psychiatry Psychiatr. Epidemiol. 43, 667–672. https://doi.org/10.1007/s00127-008-0345-x.

Benjamini, Y., Hochberg, Y., 1995. Controlling the false discovery rate: a practical and powerful approach to multiple testing. J. R. Stat. Soc. Ser. B 57, 289–300. https://doi.org/10.1111/j.2517-6161.1995.tb02031.x.

Bert, F., Lo Moro, G., Corradi, A., Acampora, A., Agodi, A., Brunelli, L., Chironna, M., Cocchio, S., Cofini, V., D'Errico, M.M., Marzuillo, C., Pasquarella, C., Pavia, M., Restivo, V., Gualano, M.R., Leombruni, P., Siliquini, R., Group, C., 2020. Prevalence of depressive symptoms among Italian medical students: the multicentre cross-sectional "PRIMES" study. PLoS ONE 15, e0231845.

Bertani, D.E., Mattei, G., Ferrari, S., Pingani, L., Galeazzi, G.M., 2020. Anxiety, depression and personality traits in Italian medical students. Riv. Psichiatr. 55, 342–348. https://doi.org/10.1708/3503.34892.

Bland, H.W., Melton, B.F., Welle, P., Bigham, L., 2012. Stress tolerance: new challenges for millennial college students. Coll. Stud. J. 46, 362–375.

Bonferroni, C.E., 1936. Teoria statistica delle classi e calcolo delle probabilità, Pubblicazioni del R. Istituto superiore di scienze economiche e commerciali di Firenze. Seeber.

Bottesi, G., Ghisi, M., Altoè, G., Conforti, E., Melli, G., Sica, C., 2015. The Italian version of the Depression Anxiety Stress Scales-21: factor structure and psychometric properties on community and clinical samples. Compr. Psychiatry 60, 170–181. https://doi.org/10.1016/j.comppsych.2015.04.005.

Browning, M.H.E.M., Larson, L.R., Sharaievska, I., Rigolon, A., McAnirlin, O., Mullenbach, L., Cloutier, S., Vu, T.M., Thomsen, J., Reigner, N., Metcalf, E.C., D'Antonio, A., Helbich, M., Bratman, G.N., Alvarez, H.O., 2021. Psychological impacts from COVID-19 among university students: risk factors across seven states in the United States. PLoS ONE 16, e0245327. https://doi.org/10.1371/journal.pone.0245327.

Carletto, S., Lo Moro, G., Zuccaroli Lavista, V., Soro, G., Siliquini, R., Bert, F., Leombruni, P., 2022. The Impact of COVID-19 on mental health in medical students: a cross-sectional survey study in Italy. Psychol. Rep. https://doi.org/10.1177/00332941221127632, 332941221127632.

Carrard, V., Berney, S., Bourquin, C., Ranjbar, S., Castelao, E., Schlegel, K., Gaume, J., Bart, P.A., Schmid Mast, M., Preisig, M., Berney, A., 2024. Mental health and burnout during medical school: longitudinal evolution and covariates. PLoS ONE 19, e0295100.

Dar, S., Hasan, S., Dar, L.K., 2022. Psychosocial factors and suicidal ideation in medical students. Rawal Med. J. 47, 202–205.

Dyrbye, L.N., Thomas, M.R., Shanafelt, T.D., 2006. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad. Med. 81, 354–373. https://doi.org/10.1097/00001888-200604000-00009.

Fekih-Romdhane, F., ElKhouni, C., Sassi, H., Cheour, M., 2021. The role of personal factors and learning environment in suicidal ideation among tunisian medical students. Crisis 42, 20–31. https://doi.org/10.1027/0227-5910/a000678.

Fina, S., Heider, B., Prota, F., 2021. Unequal Italy. Reg. Socio-Econ. Disparit. Italy.

Frajerman, A., Morvan, Y., Krebs, M.O., Gorwood, P., Chaumette, B., 2019. Burnout in medical students before residency: a systematic review and meta-analysis. Eur. Psychiatry 55, 36–42. https://doi.org/10.1016/j.eurpsy.2018.08.006.

Freeman, M., 2022. The World Mental Health Report: transforming mental health for all. World Psychiatry 21, 391–392. https://doi.org/10.1002/wps.21018.

Garner, D.M., Olmsted, M.P., Bohr, Y., Garfinkel, P.E., 1982. The eating attitudes test: psychometric features and clinical correlates. Psychol. Med. 12, 871–878. https://doi.org/10.1017/S0033291700049163.

Gaume, J., Carrard, V., Berney, S., Bourquin, C., Berney, A., 2024. Substance use and its association with mental health among Swiss medical students: a cross-sectional study. Int. J. Soc. Psychiatry. https://doi.org/10.1177/00207640241232321.

Gilbert, P., McEwan, K., Bellew, R., Mills, A., Gale, C., 2009. The dark side of competition: how competitive behaviour and striving to avoid inferiority are linked to depression, anxiety, stress and self-harm. Psychol. Psychother. 82, 123–136. https://doi.org/10.1348/147608308X379806.

Henry, J.D., Crawford, J.R., 2005. The short-form version of the depression anxiety stress scales (DASS-21): construct validity and normative data in a large non-clinical sample. Br. J. Clin. Psychol. 44, 227–239. https://doi.org/10.1348/014466505X29657.

Hooper, C., Craig, J., Janvrin, D.R., Wetsel, M.A., Reimels, E., 2010. Compassion satisfaction, burnout, and compassion fatigue among emergency nurses compared with nurses in other selected inpatient specialties. J. Emerg. Nurs. 36, 420–427. https://doi.org/10.1016/j.jen.2009.11.027.

Epicentro ISS, 2024. Sorveglianza PASSI 2021-2022. www.epicentro.iss.it/passi.

Istat, 2022. IL censimento permanente della popolazione in sicilia - ANNO 2020 [WWW Document]. https://www.istat.it/it/archivio/268007 (accessed 8.8.23).

Istat, 2021. RAPPORTO BES 2020: IL benessere equo e sostenibile in Italia [WWW Document]. https://www.istat.it/it/archivio/254761 (accessed 8.8.23).

Karyotaki, E., Cuijpers, P., Albor, Y., Alonso, J., Auerbach, R.P., Bantjes, J., Bruffaerts, R., Ebert, D.D., Hasking, P., Kiekens, G., Lee, S., McLafferty, M., Mak, A., Mortier, P., Sampson, N.A., Stein, D.J., Vilagut, G., Kessler, R.C., 2020. Sources of stress and their associations with mental disorders among college students: results of the world health organization world mental health surveys international college student initiative. Front. Psychol. 11, 1759. https://doi.org/10.3389/fpsyg.2020.01759.

Lan, H.T.Q., Long, N.T., Van Hanh, N., 2020. Validation of depression, anxiety and stress scales (Dass-21): immediate psychological responses of students in the e-learning environment. Int. J. High. Educ. 9, 125–133. https://doi.org/10.5430/ijhe.v9n5p125.

Lenzo, V., Gargano, M.T., Mucciardi, M., Lo Verso, G., Quattropani, M.C., 2014. Clinical efficacy and therapeutic alliance in a time-limited group therapy for young adults. Res. Psychother. Psychopathol. Process Outcome 17, 9–20. https://doi.org/10.4081/ripppo.2014.151.

Liu, J., Zhu, Q., Fan, W., Makamure, J., Zheng, C., Wang, J., 2020. Online mental health survey in a medical college in China during the COVID-19 outbreak. Front. psychiatry 11, 459. https://doi.org/10.3389/fpsyt.2020.00459.

Lohse, T., Rohrmann, S., Richard, A., Bopp, M., Faeh, D., 2017. Type A personality and mortality: competitiveness but not speed is associated with increased risk. Atherosclerosis 262, 19–24. https://doi.org/10.1016/j.atherosclerosis.2017.04.016.

Loscalzo, Y., Giannini, M., 2022. Covid-19 outbreak and Italian college students' well-being: evidence for both negative and positive consequences. Psychol. Hub 39, 23–32. https://doi.org/10.13133/2724-2943/17834.

Lovibond, P.F., Lovibond, S.H., 1996. Depression anxiety and stress scales. Behav. Res. Ther.

Luciano, F., Cenacchi, V., Vegro, V., Pavei, G., 2021. COVID-19 lockdown: physical activity, sedentary behaviour and sleep in Italian medicine students. Eur. J. Sport Sci. 21, 1459–1468. https://doi.org/10.1080/17461391.2020.1842910.

Mackin, D.M., Kotov, R., Perlman, G., Nelson, B.D., Goldstein, B.L., Hajcak, G., Klein, D. N., 2019. Reward processing and future life stress: stress generation pathway to depression. J. Abnorm. Psychol. 128, 305–314. https://doi.org/10.1037/abn0000427.

Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C., Roma, P., 2020. A nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: immediate psychological responses and Associated Factors. Int. J. Environ. Res. Public Health. https://doi.org/10.3390/ijerph17093165.

Meda, N., Pardini, S., Rigobello, P., Visioli, F., Novara, C., 2023. Frequency and machine learning predictors of severe depressive symptoms and suicidal ideation among university students. Epidemiol. Psychiatr. Sci. 32 https://doi.org/10.1017/S2045796023000550.

Meda, N., Pardini, S., Slongo, I., Bodini, L., Zordan, M.A., Rigobello, P., Visioli, F., Novara, C., 2021. Students' mental health problems before, during, and after COVID-19 lockdown in Italy. J. Psychiatr. Res. 134, 69–77. https://doi.org/10.1016/j.jpsychires.2020.12.045.

Mittal, R., Su, L., Jain, R., 2021. COVID-19 mental health consequences on medical students worldwide. J. Community Hosp. Intern. Med. Perspect. 11, 296–298. https://doi.org/10.1080/20009666.2021.1918475.

Moir, F., Yielder, J., Sanson, J., Chen, Y., 2018. Depression in medical students: current insights. Adv. Med. Educ. Pract. 9, 323–333. https://doi.org/10.2147/AMEP.S137384.

Patrono, A., Renzetti, S., Manco, A., Brunelli, P., Moncada, S.M., Macgowan, M.J., Placidi, D., Calza, S., Cagna, G., Rota, M., Memo, M., Tira, M., Lucchini, R.G., 2022. COVID-19 aftermath: exploring the mental health emergency among students at a Northern Italian University. Int. J. Environ. Res. Public Health. https://doi.org/10.3390/ijerph19148587.

Porru, F., Schuring, M., Bültmann, U., Portoghese, I., Burdorf, A., Robroek, S.J.W., 2022. Associations of university student life challenges with mental health and self-rated health: a longitudinal study with 6 months follow-up. J. Affect. Disord. 296, 250–257. https://doi.org/10.1016/j.jad.2021.09.057.

Puthran, R., Zhang, M.W.B., Tam, W.W., Ho, R.C., 2016. Prevalence of depression amongst medical students: a meta-analysis. Med. Educ. 50 https://doi.org/10.1111/medu.12962.

Ragab, E.A., Dafallah, M.A., Salih, M.H., Osman, W.N., Osman, M., Miskeen, E., Taha, M. H., Ramadan, A., Ahmed, M., Abdalla, M.E., Ahmed, M.H., 2021. Stress and its correlates among medical students in six medical colleges: an attempt to understand the current situation. Middle East Curr. Psychiatry 28, 75. https://doi.org/10.1186/s43045-021-00158-w.

Rosal, M.C., Ockene, I.S., Ockene, J.K., Barrett, S.V., Ma, Y., Hebert, J.R., 1997. A longitudinal study of students' depression at one medical school. Acad. Med. 72.

Rotenstein, L.S., Ramos, M.A., Torre, M., Segal, J.B., Peluso, M.J., Guille, C., Sen, S., Mata, D.A., 2016. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis. JAMA 316, 2214–2236. https://doi.org/10.1001/jama.2016.17324.

Schnoes, A.M., Caliendo, A., Morand, J., Dillinger, T., Naffziger-Hirsch, M., Moses, B., Gibeling, J.C., Yamamoto, K.R., Lindstaedt, B., McGee, R., O'Brien, T.C., 2018. Internship experiences contribute to confident career decision making for doctoral students in the life sciences. CBE Life Sci. Educ. 17 https://doi.org/10.1187/cbe.17-08-0164.

Slavin, S.J., 2016. Medical student mental health: culture, environment, and the need for change. JAMA. https://doi.org/10.1001/jama.2016.16396.

Sreeramareddy, C.T., Shankar, P.R., Binu, V.S., Mukhopadhyay, C., Ray, B., Menezes, R. G., 2007. Psychological morbidity, sources of stress and coping strategies among undergraduate medical students of Nepal. BMC Med. Educ. 7, 26. https://doi.org/10.1186/1472-6920-7-26.

Storrie, K., Ahern, K., Tuckett, A., 2010. A systematic review: students with mental health problems–a growing problem. Int. J. Nurs. Pract. 16, 1–6. https://doi.org/10.1111/j.1440-172X.2009.01813.x.

Tarchi, L., Moretti, M., Osculati, A.M.M., Politi, P., Damiani, S., 2021. The hippocratic risk: epidemiology of suicide in a sample of medical undergraduates. Psychiatr. Q. 92, 715–720. https://doi.org/10.1007/s11126-020-09844-0.

Tian-Ci Quek, T., Wai-San Tam, W., X. Tran, B., Zhang, M., Zhang, Z., Su-Hui Ho, C., Chun-Man Ho, R., 2019. The global prevalence of anxiety among medical students: a meta-analysis. Int. J. Environ. Res. Public Health. https://doi.org/10.3390/ijerph16152735.

Tjia, J., Givens, J.L., Shea, J.A., 2005. Factors associated with undertreatment of medical student depression. J. Am. Coll. Heal. 53, 219–224. https://doi.org/10.3200/JACH.53.5.219-224.

World Health Organization (WHO), 2019. World suicide prevention day 2019 - 40 s of action [WWW Document]. https://www.who.int/news/item/09-09-2019-suicide-one-person-dies-every-40-seconds#:~:text=“Despite progress%2C one person still, Yet suicides are preventable (accessed 5.10.23).

World Health Organization (WHO), 2017. Depression and other common mental disorders: global health estimates. World Health Organization.