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Prevalence of depressive symptoms and suicidal ideation among Spanish medical students

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Introduction. Several international studies show high rates of depression and suicidal ideation in medical students. However, no specific data is available in Spanish students. The aim of this study is to determine the prevalence of depressive symptoms and suicidal ideation in the Faculty of Medicine of Valencia, as well as its relationship with other variables of interest.

Methods. In April 2018, all students enrolled in the Medical Degree of the University of Valencia were invited to complete the Beck Depression Inventory (BDI-II). The students participated voluntarily and the answers were anonymized.

Results. A total of 858 students (69.2% women) completed the survey (response rate of 44.7%). More than a third of the sample (39.1%) had depressive symptoms, of mild to severe intensity, while 15.8% of the students reported recent suicidal ideation. Significantly higher levels of depressive symptoms were found in women, as well as in those with a worse satisfaction with academic results, a greater perception of the need for psychological support due to recent mental health problems and in those who had ever consulted with health professionals for a mental health problem (29.4%).

Conclusions. These results are consistent with the prevalence of depression in medical students from other countries and suggest comparative studies in other Spanish universities. Medical schools should incorporate interventions to provide students with tools that improve their mental health.

Keywords: Depressive Symptoms, Suicidal Ideation, Medical Students, Survey

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Prevalencia de síntomas depresivos e ideación suicida en estudiantes de medicina españoles

Introducción. Diversos estudios internacionales muestran altas tasas de depresión e ideación suicida en estudiantes de medicina. Sin embargo, no se dispone de datos específicos en estudiantes españoles. El objetivo del presente estudio es determinar la prevalencia de síntomas depresivos e ideación suicida en la Facultad de Medicina de Valencia, así como su relación con otras variables de interés.

Metodología. En abril de 2018 se invitó a todos los estudiantes matriculados en el Grado de Medicina de la Universitat de València a completar el Inventario de Depresión de Beck (BDI-II). Los estudiantes participaron de forma voluntaria y las respuestas fueron anonimizadas.

Resultados. Un total de 858 estudiantes (69,2% mujeres) respondieron la encuesta (tasa de respuesta del 44,7%). Más de un tercio de la muestra (39,1%) presentaba síntomas depresivos, de intensidad leve a grave, mientras que un 15,8% referían ideación suicida reciente. Se encontraron niveles de síntomas depresivos significativamente más elevados en las mujeres, así como en aquellos con una peor satisfacción con los resultados académicos, una mayor percepción de necesidad de apoyo psicológico por problemas de salud mental recientes y en los que habían consultado alguna vez con profesionales sanitarios por un problema de salud mental (29,4%).

Conclusiones. Estos resultados son consistentes con la prevalencia de síntomas depresivos en estudiantes de medicina de otros países e invitan a realizar estudios comparativos en otras universidades españolas. Las facultades de medicina deberían incorporar intervenciones para proveer a los estudiantes de herramientas que mejoren su salud mental.

Palabras clave: Síntomas Depresivos, Ideación Suicida, Estudiantes de Medicina, Encuesta

INTRODUCTION

According to the World Health Organization (WHO), more than 300 million people in the world suffer from depression, a disease that affects women more than men. Depression is one of the main risk factors for suicide, which is the second leading cause of death in young people between the ages of 15 and 29 worldwide¹.

According to the 2017 National Health Survey, the prevalence of depression in the adult Spanish population is 6.7%. Furthermore, 5.4% of the population reported having seen a psychologist, psychotherapist or psychiatrist in the previous 12 months². On the other hand, the prevalence of suicidal ideation in the last 12 months is 0.89% in Spain³.

Compared with the general population, trainees and doctors have a higher prevalence of common mental disorders⁴⁻⁶, including depressive symptoms⁴, anxiety⁶ and suicidal ideation⁷. The systematic review and meta-analysis by Mata et al⁴ showed that the prevalence of depression or depressive symptoms in residents was 28.8%. Likewise, the mental health problems of residents and doctors have been associated with poorer quality of healthcare and an increase in medical errors⁸⁻¹⁰.

College students have also been shown to be at greater risk of mental health problems than the general population¹¹. A WHO study¹¹ reported that 35% of university students had suffered from a common mental disorder throughout their lives and 31% at least one, in the last 12 months. The transition to university coincides with a critical period in the development of the individual, which is characterized by the development of new social relationships and an increase in autonomy and responsibility^{12,13}. In addition, it coincides with a period in which most mental illnesses usually debut, 75% of which do so before the age of 25¹⁴.

Among the predictive factors that have been associated with depressive symptoms in university students are gender and stressful life events¹⁵. On the other hand, major depression in university students has been associated with a greater probability of tobacco consumption, although with a lower probability of excessive alcohol consumption in the form of binge eating¹⁶. The abusive use of the smartphone has recently been associated with greater depressive symptoms and a lower quality of sleep¹⁷.

The first results of the UNIVERSAL study, conducted in five Spanish universities, showed a 9.9% prevalence of suicidal ideation in the last 12 months in first-year students. Parental psychopathology, sexual violence, as well as anxiety and lifetime mood disorders were the main risk factors for suicidal ideation¹⁸.

According to the synthesis of systematic reviews by Tam et al¹⁹, the prevalence of depressive symptoms and depression in medical students is 27.0%. Similarly, the meta-analysis by Rotenstein et al²⁰ found a mean prevalence of depressive symptoms or depression of 27.2% (range: 9.3–55.9%) and 11.1% (range: 7.4–24.2%) of suicidal ideation. The information available on the causes or consequences of depression in medical students is scarce²¹.

The recent meta-regression analysis by Gonçalves Pacheco et al²² concludes that female medical students are more at risk of depression than males. A significant correlation was also found between the Gender Inequality Index and the prevalence of depression among female medical students. These last two reviews^{20,22}, which included 106 studies from 32 countries and 195 studies from 43 countries, respectively, did not include any study conducted in Spain.

In our country, the Fundación Galatea²³ studied the health of the students of the Degree in Medicine of the Catalonia region. 50.2% of women and 37.5% of men were at probable risk of poor mental health, compared to 10.6% and 7.2% of 21-year-old students in the general population, respectively. In addition, the number of risk-consuming alcohol and tranquilizers was higher in medical students than in other students, both in women and in men. In contrast, marijuana use was similar in both groups of students²³. Predictive factors for suffering from a mental disorder included neuroticism, an unfavorable opinion with the teaching received, and the presence of adverse life events in recent years²³. Oró et al²⁴ determined the level of stress perceived by the second-year students of medicine at the University of Lleida. However, both studies used generic mental health screening instruments. Therefore, nowadays there are no specific data on depressive symptoms and suicidal ideation in Spanish medical students.

The main objective of this study was: to determine the prevalence of depressive symptoms and suicidal ideation in students of the Degree in Medicine of the Universitat de València (UV). The secondary objectives were: 1) to determine the relation of these same prevalences with other variables of interest, among them gender, year of studies and satisfaction with the academic results of the previous semester; 2) to determine the relationship of the active participation in the peer-to-peer program among the first-year students with these prevalences.

METHODOLOGY

This is an observational, cross-sectional study using a survey sample. The population of interest was all the students enrolled in the Degree in Medicine of the UV in the academic year 2017-2018. The Degree in Medicine enrolls

320 new students every year. All students ($n=2,035$) were invited to complete an *ad hoc* socio-demographic survey with the following variables: gender; age; course of study; parents' educational level; type of accommodation during the academic year; satisfaction with the academic results of the previous semester; if they had ever consulted a health professional about a mental health problem and if in the past semester they had perceived the need for psychological support for recent mental health problems.

The Universitat de València has a free counseling service on psychological, sex and psycho-pedagogical issues for its students²⁵, so it was also asked whether the students knew of its existence.

At the UV there is a peer to peer mentoring program in which volunteer students who have been specifically trained are associated to first-year students of the same degree they are studying. In this study, first-year students were also asked if they had had contact with their mentors during the 2017-2018 academic year.

Participants were invited to complete the Spanish adaptation of the Beck Depression Inventory (BDI-II). The BDI-II is one of the most widely used instruments nowadays for screening for depressive symptoms and depression in the general population. This is a self-administered questionnaire composed of 21 items, it is validated in the Spanish university population and has adequate psychometric properties, including good internal consistency²⁶. The criteria and scales by Sanz et al²⁷ were used to interpret the scores according to these categories; no depression (0-13), mild depression (14-18), moderate depression (19-27), and severe depression (28-63). The reference time frame in the questionnaire is the last two weeks. Furthermore, although the BDI-II is a screening instrument for depression, item 9 has been validated for the evaluation of suicidal ideation²⁸ and has been used as a predictor of response to treatment in several studies^{29,30}.

The administration time of the BDI-II together with the socio-demographic questionnaire was around 7-10 minutes.

Procedure

During two weeks of April 2018, all the students of the UV Degree in Medicine were informed in person about the aims and objectives of the study. Students were invited to complete a self-administered and confidential survey. Student participation was voluntary and they could withdraw from the survey at any point before sending the questionnaire. The responses were anonymized. As in other similar studies³¹, participants were informed that by agreeing to submit the anonymized questionnaires, they gave their consent to participate in the study. Participation was conducted from the intranet of the UV, which guaranteed the anonym-

ity of the data collected. The data was saved in an offline database for statistical analysis. The study was conducted in accordance with the ethical principles of clinical research involving humans (WMA, Declaration of Helsinki).

Statistical analysis

To describe the distribution of the socio-demographic and clinical characteristics of the sample, measures of central tendency (mean) and dispersion (standard deviation) were used for the quantitative variables, as well as absolute (n) and relative (%) frequencies for the qualitative variables. In both cases, a two-tailed 95% confidence interval was used.

Continuous variables were compared using Student's t -test or analysis of variance (ANOVA). For comparisons of parametric variables between more than two groups, if the main effect was significant, pairwise comparisons were performed using post-hoc tests. To test the association between categorical variables, the Pearson's chi-square test (χ^2) or, where necessary, Fisher's exact test was used.

The latest available version of the SPSS program (SPSS Inc., Chicago, USA) was used for statistical analysis. In all cases, the level of statistical significance was established at a value of $p < 0.05$.

RESULTS

Sample Description

The study sample consisted of 858 students, 594 (69.2%) of them were women. From the total target population, a 44.7% of participation was obtained and the response rate decreased as the students progressed in the academic years. Nearly one in three students in the sample (29.4%) had ever consulted a health professional about a mental health problem. Only 19.8% of the sample knew of the existence of the psychological, sex and psycho-pedagogical counseling office for UV students. The descriptive variables of the sample appear in table 1.

Prevalence of depressive symptoms

Taking as reference the cut-off points for the interpretation of the BDI-II (27), 39.1% of the sample reported presenting depressive symptoms ranging from mild to severe. Specifically, 15.9% reported mild, 15.6% moderate and 7.6% severe depressive symptoms. Regarding gender, the total BDI-II score was significantly higher in women ($p < 0.001$), who also presented higher percentages in the three catego-

Table 1	Descriptive data
Variable	Total sample (n=858) N (%)
Age	
18-19	306 (35.7)
20-23	407 (47.4)
23-30	124 (14.5)
More than 30	21 (2.4)
Year of study	
First	251 (29.3)
Second	183 (21.3)
Third	127 (14.8)
Fourth	111 (12.9)
Fifth	98 (11.4)
Sixth	88 (10.3)
Mother's educational level	
University	550 (64.1)
Medium	165 (19.2)
Primary	143 (16.7)
Father's educational level	
University	524 (61.1)
Medium	172 (20)
Primary	162 (18.9)
Type of accommodation during the academic year	
With the family in the city	344 (40.1)
With the family outside the city	186 (21.7)
Shared apartment	276 (32.2)
Student residency	52 (6.1)
Satisfaction with the academic results of the previous semester	
Very satisfied	159 (18.5)
Satisfied	421 (49.1)
Not satisfied	196 (22.8)
Not satisfied at all	82 (9.6)

Table 1	Continuation
Variable	Total sample (n=858) N (%)
Ever consulted a health professional about a mental health problem	
Yes	252 (29.4)
Perceived need for psychological support for recent mental health problems	
Yes	231 (26.9)
No	417 (48.6)
I am not sure	210 (24.5)
Know the existence of the free counselling service on psychological, sex and psycho-pedagogical issues of the Universitat de València	
Yes	170 (19.8)
Contact with your mentor ^a	
Yes	196 (78)

^aFirst year students (n=251; 90 men and 161 women)

ries of clinical severity of depressive symptoms ($p=0.027$) (table 2).

Relationship of depressive symptoms with other variables of interest

Regarding satisfaction with the results of the previous semester, the BDI-II scores of the students not satisfied or not at all satisfied were significantly higher than those satisfied or very satisfied ($t=9.75$; $p<0.001$). The distribution of the categories of depressive symptoms was also significantly different according to the degree of satisfaction (Fisher=125,492; $p<0.001$). Thus, for example, 72.9% of unsatisfied students had symptoms of depression (mild: 20.7%; moderate: 32.9%; severe: 29.3%), while 73% of highly satisfied students belonged to the category "no depression."

Furthermore, there were differences among courses (ANOVA: $F=2.26$; $p=0.047$). Specifically, the total score on the BDI-II of the second-year students was significantly higher than that of the sixth-year students (post-hoc: mean difference=3,699; $p=0.027$), with no significant differences between the other years.

Table 2	BDI-II results					
		Total (n=858) Mean (SD)	Women (n=594) Mean (SD)	Men (n=264) Mean (SD)	T	p
	<i>Total BDI-II score</i>	12.52 (9.14)	13.23 (9.17)	10.92 (8.88)	-3.443	<0.001
		Total N (%)	Women N (%)	Men N (%)	X ²	p
	No depression (0-13)	523 (61)	342 (57.6)	181 (68.6)	9.15	0.027
	Mild depression symptoms (14-18)z	136 (15.9)	103 (17.3)	33 (12.5)		
	Moderate depression symptoms (19-27)	134 (15.6)	100 (16.8)	34 (12.8)		
	Severe depression symptoms (28-63)	65 (7.6)	49 (8.3)	16 (6.1)		

22% of the first year students had not had contact with their assigned mentor. However, this did not produced any significant difference in terms of the level of depressive symptoms with the group of students who had been in contact with their mentors. There were also no significant differences according to the type of accommodation or the educational level of the parents.

The depressive symptoms in the sample varied significantly according to the perception of the need for psychological support for recent mental health problems (ANOVA: $F=197.16$; $p<0.001$). Students who perceived this need had BDI-II scores (19.61 ± 9.62) significantly higher than those who did not perceive the need (7.60 ± 6.12) and those who were not sure of it. (14.50 ± 7.62). In turn, the latter reported fewer depressive symptoms than those who perceived no need for support ($p<0.001$, in all cases).

Likewise, those students who had consulted with a health professional for mental health problems scored higher on the BDI-II than those who had never consulted (16.81 ± 10.39 vs. 10.73 ± 7.92 ; $t=8.33$; $p<0.001$). About a third (29.4%) of the students who reported depressive symptoms of any severity had consulted a professional throughout their lives.

Then, the relationship between three variables was analyzed: the perception of the need for psychological support, the history of consultation for mental health problems and the severity of the depressive symptoms.

As seen in the figure 1, within the group of students who had never consulted a professional for mental health problems ($n=606$; 70.6%), 70% of those who perceived a need for help from a professional suffered from mild to severe depressive symptoms, compared to 49.4% of those who were unsure of their need and 13.9% of those who perceived no need for help. Among the students who had consulted with a professional throughout their lives ($n=252$; 29.4%),

72.5% of those who perceived a need for help suffered from mild to severe depressive symptoms, compared to a 54.5% of those who were not sure of their need and 25.7% of those who did not perceive a need for help at that time.

Prevalence of suicidal ideation

In our sample, 15.8% of the students presented suicidal thoughts evaluated using the item 9 of the BDI-II. A greater presence of suicidal thoughts was found in students who had ever consulted a professional for mental health problems ($p<0.001$). In contrast, suicidal ideation was not associated with the other variables analyzed ($p>0.05$).

DISCUSSION

Regarding the main objective of the study, 39.1% of the medical students at the University of Valencia reported having had depressive symptoms of any severity in the previous two weeks. Furthermore, 15.8% of the students reported recent suicidal ideation.

In this study, the percentage of medical students with depressive symptoms was higher than the average values in the studies reviewed by Rotenstein et al²⁰ and Gonçalves Pacheco et al²² (39.1% vs. 27.2% and 27.0%, respectively). The results of this study position the prevalence of depressive symptoms at the Universitat de València in the highest part of the range (9.3–55.9%) of the Rotenstein meta-analysis. These differences could be due, in part, to the chosen screening instrument, since the prevalence is not so different when compared with the median prevalence of the studies that used the BDI (49 out of 195) of the Rotenstein meta-analysis (32.4% vs 39.1% in the UV). Similarly, the presence of suicidal thoughts in this study (15.8%) is greater than those found in that meta-analysis (11.1%), in the UNIVERSAL

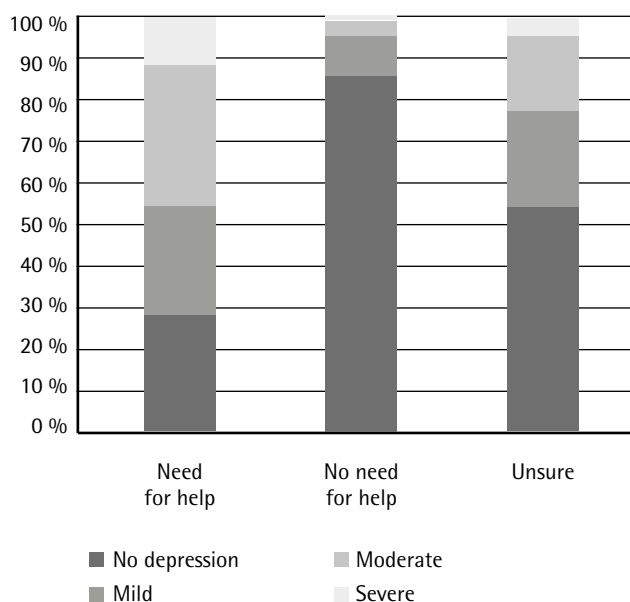


Figure 1a

Prevalence of depression symptoms in students that have never consulted a health professional (n=606; 70.6%)

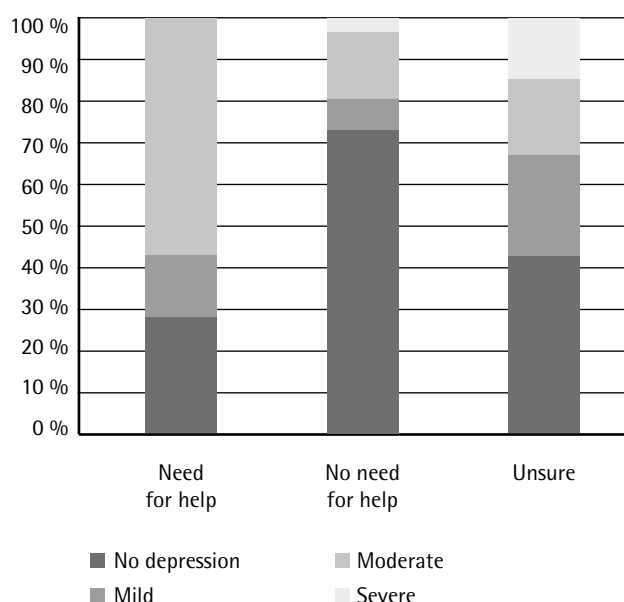


Figure 1b

Prevalence of depression symptoms in students that have ever consulted a health professional (n=252; 29.4%)

study (9.9%) and in European psychiatric residents (12.3%)^{18,20,32}. These differences could be due to the use of the item 9 of the BDI-II instead of a more specific instrument for evaluating suicidal ideation.

Regarding the secondary objectives, the female students reported more depressive symptoms than the male. These differences coincide with those described in the general population¹¹, in university students¹⁵ and, more specifically, in medical students^{8,9,17}. However, this is a controversial relationship, since similar studies have shown that depressive symptoms are either more frequent in women or do not differ according to gender²⁰.

On the other hand, the high percentage of students who perceived a need for help from a professional, suffered from depressive symptoms ranging from mild to severe and who had never consulted a mental health professional (70.6%) could be due to stigma against mental illness³⁴. It has been suggested that such stigma may significantly delay the demand for support³⁵. Within the students who scored positive for depressive symptoms or depression in the Rotenstein and Puthran meta-analyses^{16,20}, only 15.7% and 12.9%, respectively, had sought professional help; compared to 29.4% of UV medical students. This study did not explore when the consultation with the mental health professional took place. Therefore, future studies should address if the timing of consultation is related to recent symptoms.

The presence of depressive symptoms was generally independent of the academic year, except for the second-year students, who scored higher on the BDI-II than the sixth-year students. In the literature, contradictory results are found on whether the prevalence and levels of depression and suicidal ideation depend on the course. Higher levels of depression were found in both Chinese³⁷ and Saudi³⁸ medical students in the pre-clinical years. However, in other studies carried out in Mexico³⁹ or Iran⁴⁰ they did not find significant differences between the pre-clinical and clinical courses. Similarly, suicidal ideation did not vary according to the academic year or any other variable of interest, except for having consulted a mental health professional.

In general, medical schools pre-select students who tend to score higher in neuroticism and perfectionism⁴¹, which in turn may predispose the group to have poorer mental health^{23,42}. Likewise, mental health problems can appear due to situations such as setting high goals that are not finally met, such as satisfaction with the academic results. It has also been suggested that academic burden⁴³, sleep deprivation⁴⁴, exposure to death of patients⁴⁵ or unfavorable opinion with the teaching received²³ may represent additional reasons to explain the high rates of mental health problems in medical students. Evaluating the role of these factors would be of special interest in future studies.

The previous literature has studied the relationship between the severity of depressive symptoms and academic results⁴⁶, satisfaction with life in general⁴⁷ and satisfaction

with the chosen university studies⁴⁸. However, the variable of satisfaction with the academic results of the previous semester represents one of the novelties of the present study.

Subsequent studies, ideally longitudinal, should clarify whether the relationship between the degree of satisfaction and severity of depressive symptoms is causal or merely an association.

Our study observed that there were no significant differences in the severity of depressive symptoms between students who had actively participated in the first year's peer to peer mentoring program and those who had not. This could be explained because the UV peer to peer program does not specifically train mentors in supporting the mental health of their mentee students⁴⁹.

Initiatives to support the mental health of university students

The WHO has recently recommended the creation of mental health services for university students¹¹. Over the last decades, Anglo-Saxon universities have made efforts to implement specific programs to support the mental health of their students⁵⁰. The American Association of Faculties of Medicine⁵¹ recommended in 1984 that a favourable educational environment should be promoted through establishing good relationships between students and the faculty. The General Medical Council of the United Kingdom published, together with the Medical Schools Council, a guide⁵² to give advice and examples of good practice for medical schools, in order to provide the best possible support to students with mental health issues. There are also telephone and online chat lines offered by the University of Glasgow or the universities in Paris, through which students support their peers.

Within the student-led initiatives, there is a 3-day workshop designed by the International Federation of Medical Student Associations (IFMSA)⁵³ and the Oxford University's peer-to-peer program, which has around 350 students each year specifically trained to provide mental health support to their peers⁵⁴.

Study limitations and strengths

A number of limitations must be taken into account in order to interpret the results of this study. First, it was conducted at a single medical school, which may reduce its external validity. Secondly, a screening instrument, the BDI-II, was used to evaluate the prevalence of depressive symptoms, which is the most used questionnaire for this purpose. However, it is not a diagnostic instrument for clinical depression, the suspicion of which must be confirmed by an

expert clinical evaluation. Third, suicidal ideation was assessed using a BDI-II item and no specific instrument was used. Fourth, despite being a subjective variable, the satisfaction with the results of the previous four-month period was used, since the Fundación Galatea study related the satisfaction with the teaching received to a greater probability of presenting a mental disorder²³. Other authors⁵⁵ have suggested to study the relationship between the satisfaction with academic results and mental health. Fifth, the response rate was less than half of the target population, which could be due to the fact that participation in the study was voluntary and no academic or financial compensation was offered to the students. On the other hand, the fact that 45% of the students participated in this first initiative can be considered one of the strengths of the study. Therefore, the sample size of this study doubles the mean sample size of the 195 studies reviewed by Rotenstein et al²⁰, which is 336 participants. From the available data, it is not possible to determine the representativeness of the sample. However, 69% of the participants were women, which corresponds to the real gender distribution of the total students at the UV Medical School. The survey was carried out in April in order to avoid the possible influence of academic stress due to the proximity of the examination periods or a possible carry-over effect if it had been conducted shortly after the examination periods. As far as we know, this is the first study conducted in a Spanish medical school to specifically determine the prevalence of depressive symptoms and suicidal ideation. In addition, the relationship with variables of socio-demographic interest and other more innovative variables, such as satisfaction with recent academic results and participation in the peer to peer program, has been analyzed.

Recommendations

In view of the aforementioned results and the recent literature revealing the high levels of depressive symptoms and depression in residents⁴ and doctors⁵⁵, it would be interesting to study these same symptoms in medical students from other Spanish universities, as well as to compare with other university degree students. It would be advisable to implement support measures at the Spanish medical schools to provide students with tools to improve their mental health.

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CONFLICT OF INTERESTS

The authors declare that they have no conflicts of interest or have received any type of funding to conduct this study.

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