Educación Médica 24 (2023) 100795

Educación Médica

www.elsevier.es/edumed

ORIGINAL

Changes in personal perception performance during medical school: A cohort study

Agostina Rossi[a], **Mariana Escobar**[b], **Stefanny Cadavid**[c], **Daniel Vasquez**[d,e,1,*]

[a] *Neuromédica, Medellín, Colombia*
[b] *Facultad de Medicina, Universidad Pontificia Bolivariana, Medellín, Colombia*
[c] *Salud Mental Integral, Medellín, Colombia*
[d] *Grupo de Neurociencias de Antioquia, Universidad de Antioquia, Medellín, Colombia*
[e] *Facultad de Medicina, Universidad CES, Medellín, Colombia*

Received 28 August 2022; accepted 10 January 2023
Available online 20 March 2023

KEYWORDS
Medical student;
Academic performance;
Self-assessment;
Medical school;
Mental health;
Mental disorders;
Lifestyle

Abstract
Introduction: Medical students have a high academic load that interferes not only academically but also with their perception of satisfaction with their self-performance, such as sleep quality, non-medical social activities, mental health, and others. This study pretends to elucidate changes in their self-performance perception during their career and its association with the diagnosis of any mental disorder during the career.
Methods: This is an ambispective cohort of 120 medical students from CES University, Medellin, Colombia, between 2015-2016 and 2020-2021. Data was collected through a self-completed digital survey which asked about different skills and their perception of their self-performance. It was processed and analyzed using RStudio software. Finally, we used McNemar's chi-squared test to explore the statistical difference between periods and the chi-squared test to explore the association with a mental disorder diagnosed during the career.
Results: We found that satisfaction with self-performance decreases throughout the career, revealing statistically significant differences concerning time distribution, concentration, and mathematical skills between both periods. No statistical association was found between self-performance perception and mental disorder.
Conclusion: Our findings show that medical student's perception of satisfaction with their self-performance is lower towards the end of their career than at the beginning, which could be explained by academic and non-academic related factors that impact their mental health and consequently their perception of their self-performance and vice versa.

* Corresponding author.
E-mail address: daniel.vasquez@gna.org.co (D. Vasquez).
[1] Daniel Vasquez is the senior author.

https://doi.org/10.1016/j.edumed.2023.100795

PALABRAS CLAVE
Facultad de medicina;
Rendimiento académico;
Autoevaluación;
Salud mental;
Trastorno mental;
Estilo de vida;
Estudiante;
Medicina

Evaluación subjetiva del rendimiento individual durante la carrera de Medicina

Resumen
Introducción: Estudiar medicina implica una gran carga académica que puede interferir con el desarrollo de esta y esto a su vez con la satisfacción que el estudiante siente en cuando su rendimiento, afectando la calidad del sueño, la salud mental, la realización de actividades que no estén relacionadas con la carrera, entre otros. Este estudio pretende evidenciar el cambio en la percepción subjetiva del rendimiento a lo largo de la carrera y su asociación con el diagnóstico de algún trastorno mental durante la carrera.
Metodología: Se realizó un estudio de cohorte ambispectivo cuya población fueron 120 estudiantes de Medicina de la Universidad CES entre los periodos 2015-2016 y 2020-2021. Los datos fueron recolectados a través de una encuesta virtual que indagaba por diferentes habilidades y la percepción que el estudiante tenía el rendimiento en ellas. La información fue procesada y analizada por medio del software RStudio. También se aplicó la prueba de chi-cuadrado de McNemar con el fin de evaluar la existencia de diferencias estadísticamente significativas entre los periodos de estudio, y chi-cuadrado para evaluar asociación con el diagnóstico de trastorno mental durante la carrera.
Resultados: Se encontró que la percepción individual y subjetiva del rendimiento era menor en el segundo periodo que en el primero, con diferencias estadísticamente significativas en cuanto a las habilidades matemáticas, manejo del tiempo y capacidad de concentración. No se encontraron diferencias estadísticas entre el cambio en la percepción entre periodos y el diagnóstico de trastorno mental durante la carrera.
Conclusión: Los hallazgos evidencian que existe una disminución de la satisfacción respecto al rendimiento individual y subjetivo en el final de la carrera; lo cual podría ser explicado por factores académicos y no académicos que impactarían en la salud mental; esta a su vez afectando la percepcion del rendimiento y viceversa

Introduction

Undergraduate students present multiple risk factors for developing different psychiatric disorders. It is estimated that the prevalence of mental disorders is about 22 percent higher than the general population (35.0% vs. 12.9%), leading to increased student dropout and poor academic outcomes.[1]

In Colombia, most students are late adolescents or young adults starting medical school. This age is a high-risk factor for developing mental disorders, especially depression, anxiety, and sleep disorders.[2] Also, most risk factors for mental disorders in medical students have been associated with academic and social life issues,[3] including high academic pressure, increased workload, economic difficulties, interpersonal relationship issues, sleep deprivation, stressful environment, worries about their performance, and risk of failure.[4,5]

Medicine as a career is frequently considered a difficult life choice due to the little time to spare, long and extenuating study sessions, or the reduced time and quality of sleep.[6] Fortunately, family support and career enjoyment can help maintain mental health protective factors.[6] Also, high self-satisfaction has been associated with diminished stress and more accurate performance.[7]

Medical students have higher anxiety, depression, and suicidal ideation rates than non-medical students.[8] This has been attributed, at least partially, to the exposure to a high academic and social load. Some related conditions are long-lasting classes, lack of preparation when putting theoretical knowledge into practice in real clinical scenarios, competition among peers, and highly demanding evaluations.[8] These conditions increase stress which has been associated with reduced attentional capacities.[9]

Apart from the academic outcomes, the self-perception of personal performance may be a relevant but rarely measured variable in the mental health field in medical students. Thus, this paper aims to explore the perception of individual performance during school in a group of medical students, describe its change between the first and last semesters and explore its association with the diagnosis of any mental health disorder during the career.

Material and methods

This is an ambispective cohort study of 120 medical students from CES University in Medellin, Colombia. Retrospective data were taken from an Institutional Wellness Survey 2015-2016 in first-semester medical students (2015-1, 2015-2, and 2016-1), and prospective data were obtained by an electronic survey sent during 2020-2021 (2020-1, 2020-2, 2021-1) in senior medical interns.

This study derived from the "study of mental health, academic performance, habits, and lifestyles in medical students from CES University." This study was approved b the institutional review board of the Faculty of Medicine of CES University.

The 2015-2016 survey had 270 answers (about 70% of eligible), and the 2020-2021 survey had 154 answers (about 73% of eligible). However, just 120 individuals answered both surveys, and those were the registries included in this study.

Diffusion strategy

For the 2015-2016 survey, an open invitation was used for enlisting first-semester individuals who answered an electronic self-completed survey with questions related to sociodemographic, social, and lifestyle characteristics with an institutional intention to characterize its population. The 2020-2021 survey was designed based on questions considered by the researchers as relevant for the follow-up and some others. Also, the 2020-2021 survey was created using the QuestionPro platform (www.questionpro.com). The access link was sent to the senior interns' WhatsApp groups, followed by a personalized message to each one.

Variables

Participants were asked about their performance self-perception during school in the first semester and their careers in the last semester. These questions included nine different categories: time management, ability to focus attention on one activity at a time, lecture comprehension, interpersonal, oral expression quality, ability to speak in public, writing skills, mathematical skills, study methodology, and test-taking knowledge. Self-perception of personal performance was measured as a dichotomous nominal qualitative variable ("satisfied or not satisfied"). Also, academic performance self-perception during college (asked last year medical students) and school (invited to first-year medical students) were measured as an ordinal qualitative variable, including the options "deficient", "acceptable", "good", and "excellent".

Statistical analysis

Descriptive data were presented using absolute and relative frequencies. We also performed hypothesis testing with exploratory intention using McNemar's chi-squared test, looking for statistical differences between self-perception in different skills during the first and last semester. Then, a chi-squared test and fisher's exact test were used when applied to explore the association between changes in self-perception in different skills and the diagnosis of any mental disorder during the career. Data were processed and analyzed using RStudio software (version 4.1.1).

Results

A total of 120 individuals were included, 80 (66.7%) were women, and the rest were men. The mean age during the first semester was 17.7 (SD 1.1).

Nearly half of the participants (52%) considered their academic performance during school "good", similar to those who felt their performance "excellent" (47%). Also, when the last-year medical students were asked about their performance during college, the majority considered it "good" (63%), followed by "excellent" (33%) and "acceptable" (4%).

Table 1 Distribution of mental disorders diagnosed during the career (N = 120).

Any mental disorder diagnosed during the career	84/120 (70.0%)
Generalized anxiety disorder	31/120 (25.8%)
Major depressive disorder	15/120 (12.5%)
Substance use disorder	1/120 (0.8%)
Obsessive-compulsive disorder	1/120 (0.8%)
Personality disorder	2/120 (1.7%)
Other	4/120 (3.3%)

Eighty-four (70%) of the 120 participants referred to have been diagnosed with at least one mental disorder during medical school. The most common disorder was Generalized Anxiety Disorder (26%) followed by Major Depressive Disorder (13%) (Table 1).

Regarding self-perception of personal performance in first-semester medical students (2015-2016), 73% of the students were satisfied with their time management skills. Also, 80% to 90% of responders considered other skills satisfactory, except for the ability for public speaking, which was considered satisfactory in 62% of individuals (Table 2).

Table 2 Self-perception during the first and last semester in different skills of interest.

Skills	2015-2016 (N = 120)	2020-2021 (N = 120)
Time management		
Unsatisfactory	33 (27.5%)	65 (54.2%)
Satisfactory	87 (72.5%)	55 (45.8%)
Concentration		
Unsatisfactory	20 (16.7%)	62 (51.7%)
Satisfactory	100 (83.3%)	58 (48.3%)
Reading		
Unsatisfactory	15 (12.5%)	17 (14.2%)
Satisfactory	105 (87.5%)	103 (85.8%)
Interpersonal oral expression		
Unsatisfactory	24 (20.0%)	28 (23.3%)
Satisfactory	96 (80.0%)	92 (76.7%)
Public speaking		
Unsatisfactory	45 (37.5%)	51 (42.5%)
Satisfactory	75 (62.5%)	69 (57.5%)
Writing		
Unsatisfactory	14 (11.7%)	32 (26.7%)
Satisfactory	106 (88.3%)	88 (73.3%)
Mathematical skills		
Unsatisfactory	24 (20.0%)	55 (45.8%)
Satisfactory	96 (80.0%)	65 (54.2%)
Study methods		
Unsatisfactory	19 (15.8%)	41 (34.2%)
Satisfactory	101 (84.2%)	79 (65.8%)
Test-taking skills		
Unsatisfactory	16 (13.3%)	11 (9.2%)
Satisfactory	104 (86.7%)	109 (90.8%)

Similarly, the self-perception of personal performance in last-year medical students (2020-2021) was relatively constant compared with first-year registries and mainly satisfactory for test-taking skills (91%), interpersonal, oral expression (77%), and reading skills (86%). However, the skills for time management, mathematical skills, and study methods were those with a higher reduction in the category of "satisfactory" (Table 2).

Considering changes in the answer given by each individual before and after their career, nearly half of the respondents who viewed their skills for time management as satisfactory in the first semester considered it unsatisfactory during the last year (87 vs. 40). A similar pattern was seen for concentration skills (100 vs. 48) and mathematical skills (96 vs. 36). Also, a statistically significant change was seen in time management, concentration, writing, mathematical, and study methods skills. In contrast, reading, interpersonal, oral expression, public speaking, and test-taking skills were relatively constant (Table 3).

Finally, non of the variables related to changes in self-perception of the skills between the first and last year of medical school were statistically associated with the diagnosis of any mental disorder during the career (Table 4).

Discussion

Getting into medical school in Colombia starts right after high school and takes at least six years. The first two years are pre-clinical courses such as anatomy, histology, biochemistry, pharmacology, microbiology, and physiology. Then, students start their clinical rotations throughout different specialties where they have direct contact with patients and may develop their clinical hard and soft skills.

Our study explored the self-perception of personal performance in many skills related to academic performance at different stages in the career. However, we considered that it might be an objective measurement of those skills; these questions may be relevant to exploring some career-related phenomena pertinent to mental health.

Several reasons could explain the differences in the number of answers received for each survey; for example, students who failed the semester may arrive at the last semester before 2021-1, and others may abandon their careers. Lack of interest from students to participate in the second survey, unsuccessful actions to establish contact, and a more extended period needed to collect data for the first survey than the second one should also be considered.

The academic perception was rated mainly as good during university, while it was rated mainly as excellent in school. It might be expected that academic performance improves during university due to higher and specialized education. However, this was not the case, and a plausible explanation is that despite increased academic training, increased clinical demands may result in academic performance being considered insufficient. Also, it could reflect increased self-demand in the medical profession.

Table 3 Comparison between answers given by each individual during their first and last year of medical school (N = 120).

	Perception at last semester		
Perception at first semester	**Unsatisfactory**	**Satisfactory**	**McNemar's chi-squared test**
Time management			
Unsatisfactory	25 (20.8%)	8 (6.7%)	<0.01
Satisfactory	40 (33.3%)	47 (39.2%)	
Concentration skills			
Unsatisfactory	14 (11.7%)	6 (5%)	<0.01
Satisfactory	48 (40%)	52 (43.3%)	
Reading skills			
Unsatisfactory	5 (4.2%)	10 (8.3%)	0.670
Satisfactory	12 (10%)	93 (77.5%)	
Interpersonal oral expression			
Unsatisfactory	11 (9.2%)	13 (10.8%)	0.465
Satisfactory	17 (14.2%)	79 (65.8%)	
Public speaking			
Unsatisfactory	34 (28.3%)	11 (9.2%)	0.257
Satisfactory	17 (14.2%)	58 (48.3%)	
Writing			
Unsatisfactory	10 (8.3%)	4 (3.3%)	<0.001
Satisfactory	22 (18.3%)	84 (70%)	
Mathematical skills			
Unsatisfactory	19 (15.8%)	5 (4.2%)	<0.001
Satisfactory	36 (30%)	60 (50%)	
Study methods			
Unsatisfactory	12 (10%)	7 (5.8%)	<0.001
Satisfactory	29 (24.2%)	72 (60%)	
Test-taking skills			
Unsatisfactory	3 (2.5%)	13 (10.8%)	0.275
Satisfactory	8 (6.7%)	96 (80%)	

Table 4 Association between answers given by each individual during their last year of medical school and the diagnosis of any mental disorder during the career (N = 120).

	Any mental disorder diagnosed during the career		
	No	Yes	p-value
Time management			
Changed (to Unsatisfactory)	28 (23.3%)	12 (10%)	0.569
Changed (to Satisfactory)	4 (3.3%)	4 (3.3%)	
Unchanged (Unsatisfactory)	17 (14.2%)	8 (6.7%)	
Unchanged (Satisfactory)	35 (29.2%)	12 (10%)	
Concentration			
Changed (to Unsatisfactory)	37 (30.8%)	11 (9.2%)	0.106
Changed (to Satisfactory)	4 (3.3%)	2 (1.7%)	
Unchanged (Unsatisfactory)	6 (5%)	8 (6.7%)	
Unchanged (Satisfactory)	37 (30.8%)	15 (12.5%)	
Reading			
Changed (to Unsatisfactory)	9 (7.5%)	3 (2.5%)	0.420
Changed (to Satisfactory)	6 (5%)	4 (3.3%)	
Unchanged (Unsatisfactory)	5 (4.2%)	0 (0%)	
Unchanged (Satisfactory)	64 (53.3%)	29 (24.2%)	
Interpersonal oral expression			
Changed (to Unsatisfactory)	12 (10%)	5 (4.2%)	
Changed (to Satisfactory)	6 (5%)	7 (5.8%)	
Unchanged (Unsatisfactory)	9 (7.5%)	2 (1.7%)	
Unchanged (Satisfactory)	57 (47.5%)	22 (18.3%)	
Public speaking			
Changed (to Unsatisfactory)	14 (11.7%)	3 (2.5%)	0.468
Changed (to Satisfactory)	8 (6.7%)	3 (2.5%)	
Unchanged (Unsatisfactory)	25 (20.8%)	9 (7.5%)	
Unchanged (Satisfactory)	37 (30.8%)	21 (17.5%)	
Writing			
Changed (to Unsatisfactory)	13 (10.8%)	9 (7.5%)	0.604
Changed (to Satisfactory)	3 (2.5%)	1 (0.8%)	
Unchanged (Unsatisfactory)	8 (6.7%)	2 (1.7%)	
Unchanged (Satisfactory)	60 (50%)	24 (20%)	
Mathematical skills			
Changed (to Unsatisfactory)	25 (20.8%)	11 (9.2%)	0.412
Changed (to Satisfactory)	2 (1.7%)	3 (2.5%)	
Unchanged (Unsatisfactory)	15 (12.5%)	4 (3.3%)	
Unchanged (Satisfactory)	42 (35%)	18 (15%)	
Study methods			
Changed (to Unsatisfactory)	19 (15.8%)	10 (8.3%)	0.344
Changed (to Satisfactory)	3 (2.5%)	4 (3.3%)	
Unchanged (Unsatisfactory)	9 (7.5%)	3 (2.5%)	
Unchanged (Satisfactory)	53 (44.2%)	19 (15.8%)	
Test-taking skills			
Changed (to Unsatisfactory)	28 (23.3%)	12 (10%)	0.569
Changed (to Satisfactory)	4 (3.3%)	4 (3.3%)	
Unchanged (Unsatisfactory)	17 (14.2%)	8 (6.7%)	
Unchanged (Satisfactory)	35 (29.2%)	12 (10%)	

Our findings suggest that the changes in self-perception on the skills we measured vary significantly based on each skill. Time management, mathematical, and concentration skills were those with the most significant differences before and after. While a lack of continuous training may explain the changes in mathematical skills and self-perception in this area, time management, and concentration skills changes from "satisfactory" to "unsatisfactory" may reflect a higher workload and responsibilities during the career versus during high school.

Some other explanations for the decrease in academic and personal perception of performance during college include less time for study, less time for activities not related to study (e.g., practicing a sport, reading a novel, listening to music, meditating), lack of interest, moving away from home[10] and improved self-knowledge.

Related to self-knowledge, a meta-analysis made by Blanch-Hartigan et al. found that self-assessment performance was more accurate in late years medical students.[11]

Torres Velasquez and colleagues asked college students for reasons to have good academic performance; some reasons were: mood and motivation, topic interest, the place of study, and access to study material; students said that if those conditions improve, their academic performance will improve too, but neither academic performance nor self-perception was measured during this study.[12]

Also, Shan li et al. found that intrinsic motivation was significantly and positively associated with academic performance ($p < 0.001$), they also measured self-efficacy and learning engagement which also had a significant and positive relationship with academic performance.[13]

In contrast, Sattar Khan et al. did not find an association between self-efficacy and academic performance.[14] Kusurkar et al. found that intrinsic motivation, deep study methods, and study hours were associated with academic performance, while extrinsic motivation was not.[15]

Specifically, medical students have higher anxiety, depression, and suicidal behavior rates than non-medical students.[8] A meta-analysis found worldwide anxiety prevalence in medical students at 33.8%,[16] a concerning number considering that anxiety can lead to diminished quality of clinical practice and empathy towards patients.[17] Another meta-analysis reported a worldwide prevalence of depression in medical students of 27.8%, and suicide ideation worldwide pooled at a prevalence of 11.1%.[18] Like anxiety, depression could be associated with less quality of care when becoming a physician.

This study has several limitations. First, the inclusion of a population of medical students from just one medical school because sociodemographic characteristics and academic conditions may vary significantly between universities. Also, the study of just three groups of medical students explains some of the loss between first- and last-year registries.

Our negative result in the association between change in self-perception and the diagnosis of any mental disorder could be explained by several reasons. One could be the time between the diagnosis and the self-perception assessment. Also, the onset of mental disorders is explained by the confluence of multiple factors which may not be reflected in our questions.

To conclude, our study showed that perhaps the limitations, the measure of self-perception of personal performance in different skills, may be helpful to reflect other conditions related to mental health in medical students. It would be relevant for future studies to explore whether these measurements are associated with mental health and academic outcomes and how it performs in other populations. Our analysis also raises another question that might be of interest: ¿how can medical schools improve student condition so personal performance perception increases instead of decreasing?

Ethics statement

The Research and Innovation Committee of CES University approved the main project where this study was derived (code: Acta228Proy044). Also, all the individuals gave their informed consent before filling out the survey.

Funding sources

This research was carried out with personal resources; no benefit or economic support was received for its realization.

Declaration of competing interest

The present authors declared no conflict of interest for this paper.

Acknowledgments

The present authors would like to thank Doctor Paula Vasquez for her support and authorization to recollect the data and Doctor Katherine Drews for her critical review and translation of the article.

Bibliography

1. Sheldon E, Simmonds-Buckley M, Bone C, Mascarenhas T, Chan N, Wincott M, et al. Prevalence and risk factors for mental health problems in university undergraduate students: A systematic review with meta-analysis. J Affect Disord. 2021;287:282–92, 15 de mayo de.
2. Al-Khani AM, Sarhandi MI, Zaghloul MS, Ewid M, Saquib N. A cross-sectional survey on sleep quality, mental health, and academic performance among medical students in Saudi Arabia. BMC Res Notes. 2019;12(1):665, 21 de octubre de.
3. Perales A, Sogi C, Morales R. Estudio comparativo de salud mental en estudiantes de medicina de dos universidades estatales peruanas. An Fac Med. 2003;64(4):239–46, diciembre de.
4. Cova Solar F, Alvial SW, Aro DM, Bonifetti DA, Hernández MM, Rodríguez CC. Problemas de Salud Mental en Estudiantes de la Universidad de Concepción. Ter Psicológica. 2007;25(2):105–12, diciembre de.
5. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med J Assoc Am Med Coll. 2006;81(4):354–73, abril de.
6. Moutinho ILD, de Maddalena N, Roland RK, ALG Lucchetti, SHC Tibiriçá, da Ezequiel OS, et al. depression, stress and anxiety in medical students: A cross-sectional comparison between students from different semesters. Rev Assoc Medica Bras. 1992;63 (1):21–8, 1 de enero de 2017.
7. Ranasinghe P, Wathurapatha WS, Mathangasinghe Y, Ponnamperuma G. Emotional intelligence, perceived stress and academic performance of Sri Lankan medical undergraduates. BMC Med Educ. 2017;17(1):41, 20 de febrero de.
8. Cosme JAG, Landeros OG, Ramírez MII, Pérez GM, Mendoza HFM, Torres AMP. Depresión, ansiedad y conducta suicida en la formación médica en una universidad en México. Investig En Educ Médica. 2020;9(35):65–74.
9. Pradhan G, Mendinca NL, Kar M. Evaluation of examination stress and its effect on cognitive function among first year medical students. J Clin Diagn Res JCDR. 2014;8(8), agosto de. BC05-07.
10. Silva-Ramos MF, López-Cocotle JJ, Meza-Zamora MEC. Estrés académico en estudiantes universitarios. 2020;28(79):75–83.
11. Blanch-Hartigan D. Medical students' self-assessment of performance: Results from three meta-analyses. Patient Educ Couns. 2011;84(1):3–9, 1 de julio de.
12. Torres Velásquez LE, Rodríguez Soriano NY. Rendimiento académico y contexto familiaren estudiantes universitarios. Enseñ E Investig En Psicol. 2006;11(2):255–70.

13. Wu H, Li S, Zheng J, Guo J. Medical students' motivation and academic performance: the mediating roles of self-efficacy and learning engagement. Med Educ Online. 2020;25(1):1742964, 1 de diciembre de.
14. As K, C Z, Uz A, A H. Perceived self-efficacy and academic performance of medical students at Ataturk University, Turkey. J Coll Physicians Surg—Pak JCPSP [Internet]. 2013;23(7) julio de. [citado 22 de agosto de 2022]. Disponible en: https://pubmed.cesproxy.elogim.com/23823955/.
15. Kusurkar RA, Croiset G, Galindo-Garré F, Ten Cate O. Motivational profiles of medical students: association with study effort, academic performance and exhaustion. BMC Med Educ. 2013;13:87, 19 de junio de.
16. Quek TTC, Tam WWS, Tran BX, Zhang M, Zhang Z, Ho CSH, et al. The global prevalence of anxiety among medical students: a meta-analysis. Int J Environ Res Public Health. 2019;16(15), 31 de julio de. E2735.
17. Lasheras I, Gracia-García P, Lipnicki DM, Bueno-Notivol J, López-Antón R, de la Cámara C, et al. Prevalence of anxiety in medical students during the COVID-19 pandemic: a rapid systematic review with meta-analysis. Int J Environ Res Public Health. 2020;17(18), 10 de septiembre de. E6603.
18. Rotenstein LS, Ramos MA, Torre M, Segal JB, Peluso MJ, Guille C, et al. Prevalence of depression, depressive symptoms, and suicidal ideation among medical students: a systematic review and meta-analysis. JAMA. 2016;316(21):2214—36, 6 de diciembre de.