



ASSESSMENT OF PSYCHIATRIC RISK PROFILE IN MEDICAL PHYSICIANS USING CLASSROOM RESPONSE SYSTEMS "CLICKERS"

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ABSTRACT

There are relevant results that integrate a psychiatric risk profile in physicians. Applicants for a specialty education (residents) in Mexico must be selected through the National Examination of Applicants for Medical Residencies (ENARM). We seek to identify an association between the psychiatric risk profile and academic performance in the ENARM by applying the Kessler Psychological Distress Scales and the Adult Self-Report Scale of ADHD conducted during a preparation course for this exam. We found an association between being selected and a better performance in the course evaluations and an association between greater psychological distress and better performance in evaluations.

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INTRODUCTION

Medical students are usually at the end of the second decade of their life at the beginning of the career and invest into it the entire third decade. Based on the Mexican national comorbidity survey of 2007, which applied a version of the Composite International Diagnostic Interview survey, it was reported that 26 % of the population has experienced at least one psychiatric disorder and 36.4% of Mexicans will present one during their life. Children under 21 are at higher risk of developing more disorders (Medina-Mora et al, 2007). Comparisons have been made between psychological stress in medical students and students in other disciplines. Aktekinet al (2008) compared a population of medical students against economics and physical education students. The findings showed that scores for the General Health Questionnaire (GHQ), State-Trait Anxiety Inventory (STAI) and the Beck Depression Inventory (BDI) were elevated in second-year medical students compared to students of the other mentioned careers.

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Besides, stressful life event scores showed an increase from the first to the second year, and anxiety and depression rates were associated with the level of dissatisfaction in their social activities. As time progressed, medical students showed an increasing degree of anxiety and depression as well as a decrease of their health status. Burnout seems to be the most common form of stress. Study dedication and intensity in the medical career predisposes the student to develop physical and psychological exhaustion, and secondarily to present isolated symptoms of psychopathology or even psychiatric disorders. A study conducted in the United States (USA) by Dyrbye et al (2008) on burnout and suicidal ideation in medical students showed a prevalence of 11.2 %, which was higher than in individuals of the same age in the general population (6.9 %). Suicidal ideation was strongly associated with personal stress (quality of life and depressive symptoms) and professional stress (burnout). These findings suggest that burnout among medical students is a significant predictor of subsequent suicidal ideation even in the absence of symptoms of depression. Applicants for a specialty education in Mexico must be selected through the National Examination of Applicants for Medical Residencies (ENARM). It is a complex evaluation, with a high level of competence and moderate to

high difficulty. Dendle C *et al.* (2018) found a poor correlation between psychological distress and academic performance on first clinical year medical students. We define a psychiatric risk profile as a level of severity at the Kessler Psychological Distress Scale (K10), a positive screening at the Adult ADHD Screening Scale (ASRS-V1.1) and the academic performance at the preparation course evaluation. Our objective was to identify an association between a psychiatric risk profile and academic performance in the ENARM.

MATERIALS AND METHODS

Observational, longitudinal, cohort study. A total of 673 physicians were selected to participate in the study. All participants were enrolled in a preparation course for the ENARM. Their disease status was not taken into account and they were studied only once after a randomized sampling using a sociodemographic survey. The Adult ADHD Screening Scale (ASRS-V1.1) designed by the WHO was applied to assess the presence of the 18 symptoms of Criterion A for Attention Deficit Hyperactivity Disorder in adults according to the DSM IV by Reyes-Zamorano E. *et al.* (2013) Finally, the Kessler Psychological Distress Scale (K10) was applied as a brief 10-item questionnaire designed to measure the level of stress and severity associated with psychological symptoms in population, by Vargas Terrez B *et al.* (2011) The scales were applied through classroom response systems (“clickers”), which is a technology that allows appliers to respond via small, remote, hand-held keypads, simultaneously and in one place. These devices have the advantage of being able to reach immediately participants who coded positive and offer them help. It should be mentioned that the questionnaire were applied two weeks before presenting the ENARM under stress conditions for the students. Inclusion criteria: Students in the preparation course for the ENARM (female and male) who agreed to participate after signing an informed consent. Exclusion criteria: Students who did not accept signing the informed consent, students who did not adequately answered the instrument, and students who did not present the ENARM.

The present study was conducted between August and September of 2018; 673 physicians were included to take the national medical residency exam. In the block of obstetrics and gynecology, the highest average was obtained, followed by pediatrics, and in third place surgery and internal medicine 2, with internal medicine being the last one. Regarding the Kessler Psychological Distress Scale (K10) it was considered as low if the score was from 10 to 15, moderate from 16 to 21, high from 22 to 29 and very high when it was greater than 30. Regarding the Adult ADHD Screening Scale (ASRS-V1.1) a value between 0 and 12 was not considered ADHD and a value between 13 and 24 was considered as probable ADHD (positive screening).

RESULTS AND DISCUSSION

Approximately 10 % of the total were classified as probable ADHD, and almost 50 % presented a high level of psychological distress, often followed by very high discomfort (37 %). Table 1 presents the results obtained on both scales. Of the total of students, 50.4 % were unselected for the national system of residences, 40.7 % were selected, 8.6 % did not present the exam, and only two aspirants did not have a folio. Figure 1 presents a timeline of the events that occurred throughout the study. In the selected group 10.5 % (29) had

ADHD, compared to 8.2 % (28) of the unselected group ($p = 0.324$). The most frequent category of Kessler Psychological Distress Scale in the selected group was high (129), as well as in the non-selected group (168) ($p = 0.541$).

Table 1. Scores obtained in the self-applicable scale of ADHD and in the Kessler Psychological Distress Scale. Average (median) [Quartiles 25,75] (min – max)

Scale	n = 673 (%)
Probable ADHD	68 (10)
Scores for Kessler Psychological Distress Scale	28.3 (28.6) [24.7,33.8]
Kessler Psychological Distress Grades	
Low	17 (2.5)
Moderate	81 (12)
High	326 (48.4)
Very High	249 (37)

Finally, the average score obtained in the evaluations of the preparation course was 56.55 in the selected group and 50.91 in the unselected group (OR = 1.12; 95% CI 1.09 – 1.15)($p < 0.001$). In the unselected group, 290 (85.54 %) presented a category in the Kessler Psychological Distress Scale from high to very high, compared to 231 (84.3 %) for individuals in the selected group ($p = 0.669$).

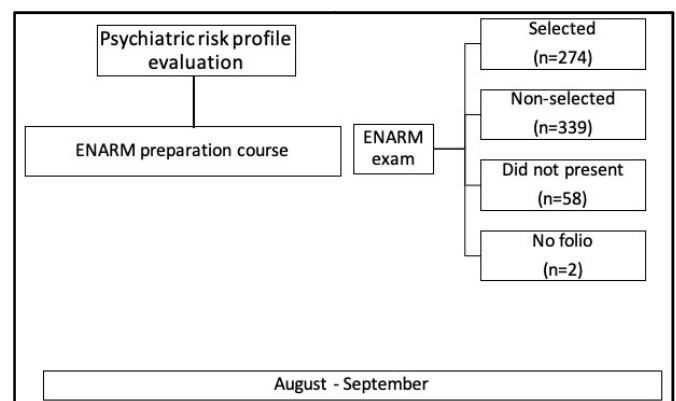


Figure 1. Timeline of events that occurred throughout the study (n=673)

The average score obtained in the exams of the preparation course was compared concerning the degree of psychological distress through the ANOVA variance analysis. The average score was 48.78 in the students with a low degree of psychological distress, 52.93 in those who had moderate discomfort, 52.79 in those who had high discomfort, and 54.2 in those who had very high discomfort ($p = 0.011$). A multiple logistic regression analysis was performed to evaluate the independent influence of each of these variables with the probability of being selected in the ENARM. Only the average score obtained in the exams of the course was significantly associated with being selected. The National Examination of Applicants to Medical Residency (ENARM), was presented by 40,000 applicants in 2018, competing for approximately 8,000 positions offered nationwide. This test is designed to select the best-trained doctors to fill these positions. Therefore, it is a critical period of stress for this population because their admission into a medical residency and their future as medical specialists depends on their performance on this examination. The participants in the study were in an intensive course of preparation for the ENARM, which took five weeks before the exam. The course is given as a lecture to a group of 673 students and covers surgery, internal medicine, pediatrics and

gynecology and obstetrics contents. For this group of young adults to have adequate academic performance in the course, it is necessary that during a month they move away from their hometown and dedicate exclusively to prepare themselves facing an extraordinary situation. Therefore, they need to be in a "privileged" economic situation, in comparison to the general population of the country in order to be able to adapt to the circumstances and overcome them.

Considerations on ADHD: The ADHD symptoms detection scale is the most widely used, although it is not diagnostic. There was no significant difference between selected and non-selected students in the scale score. However, there was a trend in favor of those selected concerning ADHD.

Considerations on psychological distress: Moderate to high psychological distress was detected in 97.5% of the participants, a condition that explains the anguish of the preparation process towards the exam. In other studies, in the medical population, moderate to high psychological distress has been detected in 26% 1. It is important to mention that the scale detects the presence of depression and anxiety symptoms, not necessarily psychopathology. Also, a tendency was found that associates a higher degree of psychological distress with being selected, without a significant difference. We hypothesized that those students with greater psychological stress and, therefore, greater anguish associated with the application of the exam, would take the exam as a priority and would have a tendency to be selected. Psychological distress is a practically generalized condition, in both selected and unselected groups. However, the only significant variable to predict the selection or non-selection of the applicants was the average score obtained in the evaluations of the preparation course. This score is the result of a sustained effort during the preparation course and the previous preparation that the students had. These results allow us to observe how the performance of both groups of students in the ENARM, cannot only be explained by the level of psychological distress and the symptoms of ADHD.

Limitations: The information was collected via e-mail, from a personal report of the participants. We do not have all the official data of the ENARM. We do not have sociodemographic information, study methods used and school of origin of the participants.

Strengths: An objective to measure is the academic performance and this also predictable by statistics. It is a well-distributed homogeneous population. We do not have applicator bias, regarding the self-applied diagnostic scales. The number of participants is representative.

Educational innovation: Use of clickers, an educational technology to answer questionnaires via remote control, was carried out. It does not require the internet; data capture is automatic, and it was used for multiple choice exams and psychopathology detection scales during the study. This technology can be used in large populations, and it does not require internet, so it is free from external hacking. It is ecological and allows respondents to have privacy and anonymity when responding. According to other reports, it has been associated with anxiety exacerbation in a few cases, due to a perception that the answers are not saved. During the preparation course, three students presented panic attacks

during the application of the exam for failures in signal reception by the clickers.

Perspectives: It is necessary to carry out prospective cohort studies focused on the mental health of this population, seeking to find what modifiable environmental factors are causing a high incidence of psychopathology and psychological distress, and apply the necessary measures to modify them. It is necessary to create awareness of the most frequent mental illnesses in this population, of the importance of seeking medical treatment and the consequences of not doing so, as a preventive measure in medical students and doctors.

Conclusions

Our findings suggest that there is a non-significant association between psychological distress and academic performance in the ENARM. Interestingly, those aspirants with the highest degree of psychological distress had better academic performance.

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