Vulnerability to stress and psychopathology among third year medical students

João Gama Marques¹, Daniel Machado¹, Silvia Ouakinin¹, and Maria Luísa Figueira¹

Abstract

Background: Some studies describe high prevalence of psychological disturbances among 3rd year medical students. The specific nature of factors like perceived stress, medical identity formation, and psychodynamic features are usually pointed as responsible for triggering factors of emotional disturbances but there is resistance among medical student to search for help. The objective of the study was to assess stress vulnerability and psychopathology risk among 3rd year medical students in Portugal.

Methods: The authors conducted a cross-sectional, survey of medical students at the biggest Portuguese medical school, through an anonymous self-report questionnaire, including sociodemographic data, psychiatric history illness, plus stress vulnerability, with 23 Questions on Vulnerability to Stress (23QVS), and psychopathology, with Symptom Checklist 90 Revised (SCL-90-R).

Results: A 56% response rate was obtained among 228 students (70.1% women), with mean age of 20.82±1.27 years (mean ± standard deviation). Main stress factor was academic issues (50%), with female being more vulnerable than male. Stress vulnerability’s mean value was 33.88 ± 9.28 (cut-off point 23QVS > 43) and SCL90R’s Global Severity Index mean value was 0.389 (cut-off point SCL-90-R > 1.5). In a subsample of 24 students, with levels of stress vulnerability above cut-off point (23QVS > 43), a positive correlation was found with interpersonal sensitivity (r=0.497; p=0.13), phobic anxiety (r=0.443; p=0.03), psychoticism (r=0.427; p=0.038) and SCL-90-R’s Global Severity Index (r=0.47; 0.02).

Conclusion: Low mean values for stress vulnerability and psychopathology were found, and among vulnerable subjects, there was a strong correlation between both dimensions.

Keywords: Stress, Psychopathology, Medicine, Students.

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Introduction

Some studies describe an especially high prevalence of psychological disturbances among medical students, namely in the 3rd year [1], with stress decreasing in the following years of medicine school [2]. This tendency has already been described before, in a small Portuguese medical school [3], but has not been generalized to other medical schools in our country, where the 3rd year is the most demanding, both in theoretical and practical classes. The specific nature of factors like perceived stress, medical education, professional practice, and psychodynamic features that lead individuals to the medical career are usually pointed as responsible for triggering factors of emotional disturbances, but unfortunately there is, whenever necessary, a huge resistance among medical student to seek help [4].

The objective of this study is to evaluate vulnerability to stress in 3rd year medical students, identifying potential risk groups, and correlating these to general psychopathology.

Methods

The survey was approved by the ethical board of the Faculty of Medicine of the University of Lisbon, Lisbon, Portugal. It included a semi-structured written interview including sociodemographic, biographical data, questions on social, familiar and sexual aspects, and questions on drug and medication use.

There was also a closed-ended question regarding plausible origin or nature of stressful event: “Did you have a main stressful event in last trimester?”, with four possible categorical answers: “Academic”, “Family”, “Health”, and/or “Economic” related issues.

Besides that, there was a scale to evaluate vulnerability to stress, 23 Questions on Vulnerability to Stress, 23QVS [5] and a psychopathology inventory, Symptom Checklist 90 Revised, SCL-90-R [6].

The 23QVS questionnaire is a Likert-type scale, rated from “totally agree” to “totally disagree”, composed of 23 questions destined for evaluation of vulnerability to stress. It includes 7 factors: F1, Perfectionism and intolerance to frustration; F2, Inhibition and functional dependence; F3, Lack/Need of social support; F4, Adverse life conditions; F5, Dramatization of existence; F6, Subjugation; and F7, Deprivation of affection and rejection. A value higher than 43 obtained in the filling of the 23QVS represents one cut-off point above which there is vulnerability to stress.

The SCL-90-R was created to detect psychopathological symptoms. This instrument is useful for evaluating patients before, during, or after treatment, in order to help understanding their evolution. The SCL-90-R is used by clinical psychologists and psychiatrists in such areas as mental health, education, and investigation. It is an inventory composed of 90 Likert-type questions, varying from “Never” to “Extremely”.

A value higher than 1.5 obtained in the filling of the SCL-90-R represents one cut-off point above which there is psychopathology. Out of the various available forms of inquiries, we opted for “paper and pen” and the test scoring was obtained manually, using a key. Results are presented in 9 Dimensions of Primary Symptoms, namely SOM = Somatization; O-C = Obsessive-Compulsive; I-S = Interpersonal-Sensitivity; DEP = Depression; ANX = Anxiety; HOS = Hostility; PHOB = Phobic Anxiety; PAR = Paranoid Ideation; and PSY = Psychoticism. There are still 3 global indexes, GSI = Global Severity Index which measures the general psychological disturbance: PSTD = Positive Symptom Distress Index that defines the intensity of the symptoms; and PST = Positive Symptom Total, which concern the number of reported symptoms.

Statistical analysis was performed using SPSS v.14 and included descriptive frequency analysis, comparison of means (t-Student, Mann-Whitney, as appropriate) and correlations (R2 Linear), using 95% confidence intervals.

Results

Out of 228 students, 127 completed questionnaires, representing a 55.7% response rate. Most (70.1%) were females, and age ranged from 19 to 27 years old, with a mean (± standard deviation) value of 20.82±1.27. The prevalence of gender of our sample was not significantly different from the complete universe of students. Most (59.9%) were living with family, more than half (57.9%) were not in a stable affective relationship and almost half (48.7%) had no previous sexual experience. Regarding life style the most used substance was alcohol (34.6%). The more important demographic data can be found in Table 1.

When asked about the origin or nature of any stressful event in the last 3 months only one fourth (24.6%) answered negative. The most common stress factor, in the last three months, was academic issues (50%).

Globally the 23QVS and SCL-90-R results were below cut-off points. We found 15.5% students highly vulnerable to stress (QVS>43) and 3.1% students with serious psychopathology (GSI SCL-90-R>1.5). Specifically there was a 23QVS mean value of 33.88 ± 9.28 (below cut-off point 43), and a GSI SCL-90-R mean value of 0.74±0.39 (below cut-off point 1.5).

There were no significant differences between genders, except for 23QVS F3 Lack/Need of social support, that was higher in female students (f=3.16; p<0.002).

Comparing the group of individuals whose value of high vulnerability to stress (23QVS>43) with the group of low vulnerability individuals (23QVS≤43) data suggests that the most important stress factor was, in the most vulnerable students, the health-related issues. On the other hand, there was a negative correlation between vulnerability to stress and both frequency of sexual activity (Figure 1) and alcohol consumption (Figure 2).

Finally, we found a pattern of correlation between
vulnerability to stress and symptoms of general psychopathology (Figure 3). By selecting the subjects above the 23QVS cut-off point (n=20), we verified a positive correlation with SCL-90-R’s interpersonal sensitivity (r=0.517; p=0.100), depression (r=0.497; p=0.130), phobic anxiety (r=0.443; p=0.030), psychotism (r=0.427; p=0.038) (Figure 4).

Table 1. Main results in sociodemographic, biographical and lifestyle data.

<table>
<thead>
<tr>
<th>Sociodemographic Characteristics</th>
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<tbody>
<tr>
<td><strong>Gender, %</strong></td>
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<td>Female</td>
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<tr>
<td>Male</td>
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<td><strong>Age</strong></td>
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<td>Range</td>
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<td>Mean ± standard deviation</td>
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<tr>
<td><strong>Living with, %</strong></td>
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<td>Family</td>
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<tr>
<td>Friends</td>
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<tr>
<td>Alone</td>
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<td>Strangers</td>
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<th>Biographical Characteristics</th>
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<tbody>
<tr>
<td><strong>Stable relationship, %</strong></td>
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<tr>
<td>No</td>
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<tr>
<td>Yes</td>
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<tr>
<td><strong>Religious person, %</strong></td>
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<td>No</td>
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<tr>
<td>Yes</td>
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<tr>
<td><strong>Main stressful event in last trimester, %</strong></td>
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<td>Academic</td>
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<td>Family</td>
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<tr>
<td>Health</td>
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<td>Economic</td>
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<tr>
<td><strong>Drug use, %</strong></td>
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<tr>
<td>None</td>
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<tr>
<td>Alcohol</td>
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<tr>
<td>Tobacco</td>
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<td>Others</td>
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<tr>
<th>Lifestyle Characteristics</th>
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<tbody>
<tr>
<td><strong>Sexual intercourse frequency, %</strong></td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Less than monthly</td>
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<tr>
<td>Less than weekly</td>
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<td>More than weekly</td>
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<tr>
<td><strong>Alcohol use frequency, %</strong></td>
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<td>Never</td>
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<td>Less than weekly</td>
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Figure 1. Correlation between sexual activity frequency and vulnerability to stress (23QVS).

Figure 2. Correlation between alcohol consumption frequency and vulnerability to stress (23QVS).

Figure 3. Correlation between psychopathology (SCL-90-R) and vulnerability to stress (23QVS).
Stress and psychopathology in medical students

University of Lisbon presented low levels of stress vulnerabilities between low vulnerability to stress (23QVS ≤ 43) and high vulnerability to stress (23QVS > 43). This data suggests that family may have an important role on the genesis of stressful events, probably worsen medical students’ vulnerability to stress and other type of psychopathology.

In students highly vulnerable to stress, a strong correlation was found with other psychopathology. Moderate alcohol intake and healthy sexual activity were negatively correlated with stress, suggesting that an active social life may protect medical students from mental distress.

The coexistence of stress and depression in medical students has been described [24, 25], but its interpretation is difficult. Our results showed that besides depression also interpersonal sensitivity, psychoticism, and phobic anxiety symptoms can be correlated with higher vulnerability to stress, in medical students. Still, as in previous works, it is hard to say whether stress vulnerability is cause or effect of these kind of symptoms.

We also found a possible relationship between social behaviour patterns and stress vulnerability: those with higher frequencies of alcohol consumption and sexual activity seem to be less vulnerable to stress. We believe that this correlation may result from wider social capacities and better integration with peers. We also suggest that less alcohol consumption means less interaction with colleagues and friends, especially in Portugal, a country with a lasting cultural tradition in alcohol beverages [26] and drinking habits across all ages and social positions. Following this idea less sexual activity would also mean less interaction with peers, resulting in social isolation, less social support, and thus a higher vulnerability to stress. In any case, these results should be cautiously interpreted as problematic sexual experiences [27], and especially alcohol abuse [28] can probably worsen medical students’ vulnerability to stress and other type of psychopathology.

One of the main limitations of this study was the transversal perspective and the small size of sample, with only 56% response rate. In contrast to others, we did not examine the possible correlation of other stress-related factors as alexithymia [29,30], personality traits [31, 32], coping styles [33–35], burnout [36–38], and the prevalence of stress among medical students [39]. It would be of especial interest to correlate these findings with future levels of burnout syndrome, as stress has been previously described as an important risk factor for burnout [40].

However our results are still pertinent as stress vulnerability is an important aspect to understand better ways to support this population, using both traditional approaches [41,42], but also internet-based instruments [43,44]. This kind of approach shall be used in future studies of our group, while on the other hand, it would be also important to investigate a possible correlation between stress vulnerability, biological markers of stress [45], and academic success [46].

More detailed and longitudinal investigations shall be conducted, including randomized sampling and group control. This kind of data give us some insight about the previous studies, and might help in further opportunities for the creation of support structures in the prevention of burnout among this especially vulnerable population.

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Competing interests

The authors declare no conflict of interest.
References


