Preliminary communication

Depression in medical students: Cluster symptoms and management

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ABSTRACT

Background: Rates of depression among medical students have been shown to be high and related to year of study and other factors. We report on cluster of symptoms related to depression and their association with other difficulties in specific domains.
Methods: 481 (Response rate=79.8%) medical students completed a questionnaire about areas of difficulty in the medical school (studies, leisure, colleagues, professors, and patients), and Beck Depression Inventory (BDI). We studied correlation among areas of difficulty and clusters of BDI along with year in the course.
Results: Two areas which contributed most difficulty were studies and leisure. The significant associations for studies were seen between somatic cluster of depressive symptoms and the level of the course. Difficulties associated with leisure activities and with colleagues were correlated with the affective cluster of symptoms of depression. Activities related to clinical matters especially working with patients in the internship year were associated with somatic clusters. The different associations confirmed that rather than relying on scores emphasis should be placed on clusters of symptoms.
Limitations: Sample from a single medical school.
Conclusions: Although the clusters are associated with specific difficulties, it is important that educators and health professionals are aware of streesors the medical students face. The correlations if confirmed in future studies with qualitative factors could guide the development of more specific therapeutic or curriculum interventions.

1. Introduction

It is well known that medical students often face many difficulties during their medical curriculum (Dahlin et al., 2005; Castaldelli-Maia et al., 2012). If these difficulties are ignored, they are likely to produce further stress and affect academic activity in individuals (Dyrbye et al., 2006a), who are already in very high pressure settings. It is inevitable that stress may compromise future professionalism (Givens and Tjia, 2002; Prince et al., 2007). Stress is also known to lead to further emotional disturbances (Dahlin and Runeson, 2007) and suicidal ideation (Tyssen et al., 2001; Alexandrino-Silva et al., 2009). It has been argued that these factors can be ameliorated through modifications of the curriculum (Hassed et al., 2009; Holm et al., 2010, Zijdenbos et al., 2010). However, the specific areas of difficulty and their relation to specific symptoms of depression may allow us to develop targeted interventions.

There is no doubt that difficulties related to performance in academic activities will influence their functioning (Shapiro et al., 2000; Smith et al., 2007; Baldassin et al., 2008; Ahmed et al., 2009). High rates of drop out from medical school are linked with high rates of depressive symptoms (Dyrbye et al., 2011). Various processes from competition in gaining admission to medical school, first and subsequent contacts with death, pathologic processes, the fear of acquiring diseases, and feelings of inadequacy have all been reported to cause emotional distress (Nogueira-Martins et al., 2006). In addition ragging and low levels of social engagement have been identified as contributing to depressive symptoms (Castaldelli-Maia et al., 2012). Medical training itself has been shown to be a risk factor in production and maintenance of depressive symptoms (Ahaneku, 2000; Kawada et al., 2007; Jeon et al., 2009). Thus it is

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critical that, the medical schools area aware of these risks (Givens and Tjia, 2002) and provide suitable, direct, and fast interventions to help the students (Merritt et al., 2007).

Like in most interventions, treatment (whether it is counseling, cognitive behaviour therapy or supportive psychotherapy) will work only if they are targeted appropriately and needs are clearly identified. Hence, this study aimed to evaluate the relationship of areas of difficulty as well as presence of depressive symptoms in medical students. We were also interested in exploring areas of stress and distress and possible relationship between cognitive, affective, and somatic clusters of the Beck Depression Inventory (BDI).

2. Methods

2.1. Sample

The medical school's ethics committee approved this study. Written consent forms were obtained from all participating. Total anonymity in data analysis was guaranteed. The medical school had a total of 603 eligible students. The medical course in this medical school lasts 6 years. The total is divided into a pre-clinical stage (1st and 2nd years), a clinical stage (3rd and 4th years), and an internship (5th and 6th years). The questionnaires were administered to all students who were present in the classroom before academic activities at random times.

The Student health service was alerted and enlisted in the case of any distress related to answering the questionnaire.

2.2. Questionnaires

A separated questionnaire produced by the authors looked at grouped areas of distress was used. The five areas of difficulty identified pertained to areas of studies, leisure activities, peers and colleagues, teachers and professors and lastly with patients. The questionnaire was scored according to four levels of intensity: 1 — almost never, 2 — sometimes, 3 — frequently, and 4 — almost always.

We assessed the presence of depressive symptoms among medical students using the Beck Depression Inventory (BDI), a 21-item self-report inventory designed to measure the severity of depressive symptomatology (Goldston et al., 1990) which has been validated in Portuguese (Gorenstein and Andrade, 1996).

Depressive symptoms can be grouped into a number of clusters (Fleck et al., 2004) which are much more helpful in understanding clinical experience rather than single BDI score. These characteristics of depressive symptoms among medical students have been reported previously (Baldassin et al., 2008). To summarise, we organized the BDI into three different clusters:

- Affective cluster (the sum of scores on the following items: sadness, episodes of crying, irritability, lack of satisfaction, and interest for people)
- Cognitive cluster (the sum of scores on the following items: pessimism, sense of failure, guilt, expectation of punishment, dislike of self, self-accusation, suicidal ideation, indecisiveness, change in the body image, somatic preoccupation)
- Somatic cluster (the sum of scores on the following items: slowness, insomnia, fatigue, loss of appetite, weight, and sexual interest)

2.3. Statistical analyses

A number of statistical analyses were performed using the window's statistical package for social sciences (version 13.0).

These included, analysis of variance (ANOVA) with *post-hoc* Tukey test allowing for group comparisons. Pearson correlations between depressive scores within the three levels (basic, intermediate, and advanced) were carried out. A multiple-regression analysis using the BDI scores by clusters as a dependent variable which compared areas of difficulties and course levels, as independent factors ("enter method") was conducted. In addition, depending upon a BDI score of > 16 was used as a cut-off to detect a dysphoric range and BDI > 20 to detect a considered a depression range (Gorenstein and Andrade, 1996) a logistic regression was performed. To evaluate possible relationships between multiple variables we used classification tree methods, with a minimal 100 cases (parent nodes) before any division, not allowing less than 30 cases by group. The significance level used was a $p < 0.05$.

3. Results

The overall response rate of the medical students was 79.7% ($n = 481$). and of these, 40.5% ($n = 195$) were males. The comparison between 125 absentees (19.7%) and respondents regarding gender ($p = 0.19$) and age range < 20 years old and > 20 years old ($p = 0.28$) were not statistically significant.

3.1. Areas of difficulty and clusters of depressive symptoms

On comparing areas of difficulties with clusters of depressive symptoms (Fig. 1) we found that for difficulties in studies and with patients, the somatic cluster ($\chi^2 = 69.778$, $df = 6$, $p < 0.001$ and $\chi^2 = 15.774$, $df = 2$, $p < 0.01$, respectively) and the level of the course ($\chi^2 = 22.077$, $df = 6$, $p < 0.01$ and $\chi^2 = 17.734$, $df = 3$, $p < 0.01$, respectively) were clearly associated. For difficulties in the spheres of leisure and colleagues, interestingly the affective cluster was the only significant association ($\chi^2 = 35.092$, $df = 3$, $p < 0.001$, and $\chi^2 = 53.522$, $df = 6$, $p < 0.001$, respectively). For professors, the level of the course showed a significant association ($\chi^2 = 23.983$, $df = 3$, $p < 0.001$).

3.2. Areas of difficulty and level of the course

The most statistically significant areas of difficulties referred by the students were as follows: studies (28.7%), leisure (20.6%), colleagues (15.2%), professors (8.1%), and patients (1.4%), and these areas showed a significant association with the level of the course (Table 1). Next most common difficulties were related to leisure (11.6%) but for the students in clinical studies this became third after colleagues (16.1%).

3.3. Clusters of depression and level of the course

When studying the level of the course, the *post-hoc* Tukey showed significant depressive symptom score differences between the internship stage (11.7 ± 7.2) in comparison to the pre-clinical stage (8.6 ± 7.9) and the clinical stage (7.0 ± 6.9; $p = 0.001$ and $p < 0.001$, respectively).

The ANOVA of the clusters of depressive symptoms among the three levels, namely the pre-clinical, the clinical, and the internship stage, resulted in significant differences with respect to the affective cluster (2.1 ± 2.7, 1.8 ± 2.0, and 3.5 ± 2.4, respectively, $F = 22.220$, $p < 0.001$), cognitive cluster (3.9 ± 3.9, 3.1 ± 3.5, and 4.7 ± 3.8, respectively, $F = 6.493$, $p = 0.002$), and somatic cluster (2.8 ± 2.2, 2.1 ± 2.2, and 3.8 ± 2.6, respectively, $F = 19.927$, $p < 0.001$).