# Prevalence of Psychological Distress among Undergraduate Medical Students: A Cross-Sectional Study

## Abstract

**Background:** Stressful environment in medical school often has a negative effect on students' psychosocial well-being. An in-depth understanding of how medical students experience psychological distress and coping is necessary for the prospective students. **Objectives:** To estimate the prevalence of psychological distress among undergraduate medical students and its association with some demographic factors. **Materials and Methods:** A cross-sectional descriptive study was conducted among 380 medical students in the University of the West Indies, Saint Augustine. The questionnaires used in this study consisted of two components – (i) the demographic information that required participants to provide their gender, age, year of study, and nationality and (ii) Depression, Anxiety, and Stress Scale-21 items to measure the levels of psychological distress among participants. **Results:** Anxiety was the most prevalent psychological distress among medical students, with 63% of them having anxiety symptoms. Depression was found to be the second most common psychological distress, with a prevalence of 51%, while 48% of the students suffered from stress. In further analysis, we found that Trinbagonian students were more depressed than the students from Caribbean Community and other nationality. Higher anxiety score was significantly associated with gender and age of the students. There was a significant association between students from different age groups and level of stress. **Conclusions:** A considerable number of students studying medicine are suffering from psychological distress. Intervention programs to address the mental health problems of such students should be initiated.

**Keywords:** *Medical students, Mental Health, psychological distress*

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## Introduction

Medical education involves fulltime commitment and responsibility of undergraduates to achieve learning outcomes necessary to become a competent health professional.[1] Students face tremendous pressure because of enormous workload and academic demands that require during their long course of studying. The continuous and challenging learning experiences that students come across during medical training may, in some cases, result in psychological distress among students.[2,3] Psychological distresses among medical students have a negative impact on students' academic and personal lives, such as increased drop-out rates from medical school, poor academic performance, broken relationships, loneliness, poor sleep, substance abuse, and suicide.[4,5]

Psychological distress is defined as "the unique discomforting, emotional state experienced by an individual in response to a specific stressor or demand that results in harm, either temporary or permanent, to the person."[6] It is the exposure to a stressful event that affects physical or mental health, inability to manage effectively with this stressor, and emotional chaos that result from this ineffective coping.[7,8] It is also defined as a state of emotional suffering characterized by the symptoms of depression and anxiety.[8,9]

Literature reveals high prevalence of psychological distress among medical students than in general population, both in the Eastern and Western countries.[10-13] Numerous studies have found gender differences in psychological distress, with females reporting more psychological distress than males.[9,14,15]

The medical curriculum at the Faculty of Medical Sciences, the University of the West Indies (UWI), Saint Augustine, consists of basic and clinical courses. The instructional methods include lectures,

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problem-based learning, laboratory training, and clinical rotations.[16,17] There has been concern about the mental health issues of the students as raised by a number of students at the School. The heavy workload, curriculum burden, and ancillary courses are being considered as the potential reasons for these perceived psychological problems. This led us to design the present study to explore the prevalence of psychological distress in our students. We designed this study to assess the level psychological distress among medical students at the UWI and to identify the possible correlates such as gender, age, year of study, and ethnicity.

## Materials and Methods

### Study design and setting

A cross-sectional, descriptive survey was conducted in the academic year 2017/2018 where we collected the data from year 1 to 3 medical undergraduate students. Students were approached to fill the questionnaires before the semester-end examinations.

### Participants

In this study, we used convenient sampling to select sample from year 1 to 3 MBBS students.

The sample size was calculated using the formula: $n = (Z_{1-\alpha})^2 \times (P\,[(1-P)]/D^2)$, where $Z_{1-\alpha} = Z_{0.95} = 1.96$, D is the margin of error (0.05), and $P$ is the proportion of depression, anxiety, and stress among students (34.6%, 37.2%, and 47.1% in this study).[18] According to the formula, the sample size needed for the study was 368. Of 788 students (year 1: 270, year 2: 260, and year 3: 258) who were invited to participate in the study, 395 students commenced the survey and 380 completed the survey.

### Study instruments

The questionnaires used in this study consisted of two components – (i) the demographic information that required participants to provide their gender, age, year of study, and nationality and (ii) Depression, Anxiety, and Stress Scale-21 items (DASS-21) to measure the levels of psychological distress among medical students. DASS-21 is an international recognized validated tool to assess the information on depression, anxiety, and stress.[19] It is a set of three self-report scales, with a total of 21 items that measure the level of depression, anxiety, and stress. Each scale has seven items, and each item is answered on a 4-point rating scale ranging from 0 = "did not apply to me at all" to 3 = "applied to me very much or most of the time." According to the DASS-21 Manual, the response given by students on each subscale was multiplied by 2 and then classified into five categories, such as normal, mild, moderate, severe, and extremely severe disorder.[20]

Scores ranging 0–9 for depression, 0–7 for anxiety, and 0–14 for stress fall in the normal category. Scores above these ranges indicate the degree of the problem from mild to extreme. Internal consistencies of the DASS scales in both the 42- and 21-item versions: depression (range = 0.91–0.97); anxiety (range = 0.81–0.92); and stress (range = 0.88–0.95) – were found to be excellent.[12,21] In the current study, the internal consistency (Cronbach's alpha) for depression, anxiety, and stress was found to be 0.90, 0.84, and 0.86, respectively.

### Ethical permission

For the present study, ethical approval was obtained from the Campus Ethics Committee of the UWI, Saint Augustine. We took verbal consent from all participants before filling the questionnaire, and they were explained about the objectives of the study. The participation of students was voluntary, and they were assured about the confidentiality.

### Statistical analysis

The collected data were analyzed by one of the authors using Statistical Package for the Social Sciences (SPSS) version 24.0 software, SPSS, Inc., Chicago, IL, USA. We calculated percentage values of gender, age, year of student, and nationality for stress, anxiety, and depression scores. Since the data were not normally distributed, we used Chi-square test at 5% level of significance to find significant association between demographic characteristics of students and presence of psychological distress. $P < 0.05$ was taken as the cutoff for commenting statistically significant association.

## Results

### Demographic characteristics of respondents

Table 1 presents the demographic profile of the participants. Of 380 participants, a total of 132 1st-year, 135 2nd-year, and 113 3rd-year students completed the questionnaire. The sample comprised more females (62.89%) than males (37.11%). A majority of the students (60%) were under the age of 22 years. Most of the students were from the Republic of Trinidad and Tobago (89.47%), with the remainder from Caribbean Community (CARICOM) (7.63%) and other countries (2.89%).

### Prevalence of psychological distress

The overall mean scores for the depression subscale was 12.82 and the standard deviation was 11.27. The mean and standard deviation for anxiety subscale are 12.99 and 10.38, respectively. Stress subscale scores had a similar distribution with a higher value of mean, i.e., 15.75, and a standard deviation of 10.41.

Anxiety was the most prevalent psychological distress among medical students, with 63% of them having anxiety symptoms. In further subcategory, anxiety symptoms were mild in 7%, moderate in 18%, severe in 11%, and extremely severe in 27% of the students. Depression was found to be

the second most common psychological distress with the prevalence of 51%, while 48% of the students suffered from stress. In addition, depression symptoms were mild in 12%, moderate in 15%, severe in 10%, and extremely severe in 14% of the students. Similarly, stress symptoms were mild in 13%, moderate in 14%, severe in 14%, and extremely severe in 7% of the students. The DASS-21 subscale scores are represented in Figure 1.

There was no significant association between depression and each of the following: gender, study year, and age ($P$ = 0.66, 0.064, and 0.079, respectively). Table 2 shows that the prevalence of depression among study participants was over 50% with slightly increasing

prevalence among males (52.48%) compared to females (50.21%). The percentage of depression represented 47.73% in the 1st-year, 51.86% in the 2nd-year, and 53.98% in the 3rd-year students. With respect to the age factor, the depression level is higher in the students between the ages of 22 and 24 years (58.70%) compared to the ages 22 or below (50.88%) and 25 or above (40%).

The prevalence of depression was the highest among the Trinbagonian students (53.24%), followed by the students from CARICOM (31.03%) and other countries (36.36%). There was a significant association between the nationality and the depression levels ($\chi^2$ test for trend = 6.248, $P$ = 0.04).

Table 3 shows that the proportion of female students who had anxiety was higher (66.95%) than their counterpart males (56.74%) ($\chi^2$ = 3.971, $P$ = 0.04). No association was found between study year and level of anxiety ($P$ = 0.735). Further, no statistically significant association was found between the students from Trinbagonian, CARICOM, and other nationals, regarding their state of anxiety. However, there was a significant association between age of the students and anxiety levels ($\chi^2$ test for trend = 8.603, $P$ = 0.014).

The perceived stress level measured by the DASS-21 was analyzed for variability within subgroups of medical students [Table 4]. There was no statistically significant association between gender and stress level ($P$ = 0.537). Furthermore, no significant association was found between students' study year and their level of stress ($P$ = 0.269). Further, no significant association was

### Table 1: Demographic information of the participants

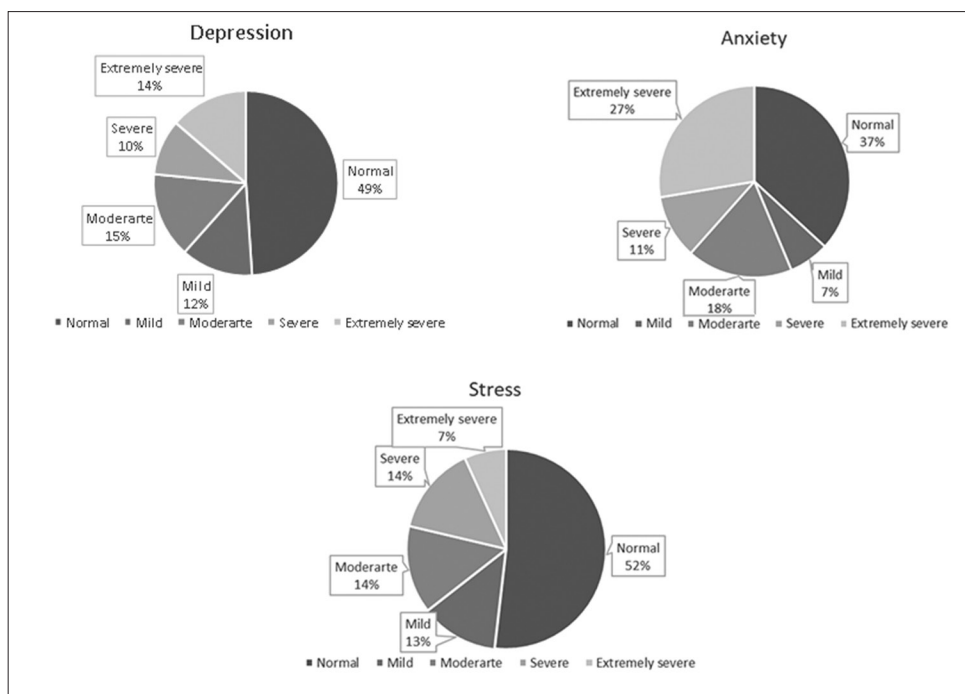| Participants characteristics | Frequency (%) |
|---|---|
| Gender | |
| Male | 141 (37.11) |
| Female | 239 (62.89) |
| Current class | |
| Year 1 | 132 (34.74) |
| Year 2 | 135 (35.53) |
| Year 3 | 113 (29.74) |
| Age | |
| Below 22 | 228 (60)) |
| 22-24 | 92 (24.21) |
| Above 25 | 60 (15.79) |
| Nationality | |
| Trinbagonian | 340 (89.47) |
| CARICOM | 29 (7.63) |
| Others | 11 (2.89) |



Figure 1: The Depression, Anxiety, and Stress Scale-21 subscale scores range from normal to extremely severe

## Table 2: Association between depression and study variables

| | Present, *n* (%) | Absent, *n* (%) | $\chi^2$ | *P* |
|---|---|---|---|---|
| Gender | | | | |
| Male | 74 (52.48) | 67 (47.52) | 0.183 | 0.668 |
| Female | 120 (50.21) | 119 (49.79) | | |
| Year of study | | | | |
| Year 1 | 63 (47.73) | 69 (52.27) | 1.007 | 0.604 |
| Year 2 | 70 (51.86) | 65 (48.15) | | |
| Year 3 | 61 (53.98) | 52 (46.02) | | |
| Age | | | | |
| Below 22 | 116 (50.88) | 112 (49.12) | 5.09 | 0.079 |
| 22-24 | 54 (58.70) | 38 (41.30) | | |
| 25 and older | 24 (40) | 36 (60) | | |
| Nationality | | | | |
| Trinbagonian | 181 (53.24) | 159 (46.76) | 6.248 | 0.044 |
| CARICOM | 9 (31.03) | 20 (68.97) | | |
| Others | 4 (36.36) | 7 (63.64) | | |
| Total | 194 (51.05) | 186 (49.21) | | |

## Table 3: Association between anxiety and study variables

| | Present, *n* (%) | Absent, *n* (%) | $\chi^2$ | *P* |
|---|---|---|---|---|
| Gender | | | | |
| Male | 80 (56.74) | 61 (43.26) | 3.971 | 0.046 |
| Female | 160 (66.95) | 79 (33.05) | | |
| Year of study | | | | |
| Year 1 | 84 (63.64) | 48 (36.37) | 0.615 | 0.735 |
| Year 2 | 82 (60.74) | 53 (39.26) | | |
| Year 3 | 74 (65.49) | 39 (34.51 | | |
| Age | | | | |
| Below 22 | 149 (65.35 | 79 (34.65) | 8.603 | 0.014 |
| 22-24 | 63 (68.48 | 29 (31.52) | | |
| 25 and older | 28 (46.67) | 32 (53.33) | | |
| Nationality | | | | |
| Trinbagonian | 221 (65) | 119 (35) | 5.034 | 0.081 |
| CARICOM | 13 (44.83) | 16 (55.17) | | |
| Others | 6 (54.55) | 5 (45.45) | | |
| Total | 240 (63.16) | 140 (36.84) | | |

found between students from different nationality and stress level (*P* = 0.102). However, there was a statistically significant association between students from different age groups and level of stress (*P* = 0.032). The stress level of students between the ages of 22 and 24 years was higher (54.35%) compared to the students below 22 years (49.56%) and above 24 years (33.33%).

## Discussion

The current study established a high prevalence of psychological distress among medical students, which may impair behavior of students, diminish learning, and ultimately affect patient care after their graduation. The prevalence of depressive symptoms in West Indian medical students (51.05%) is higher than the global prevalence (28.0%) estimated by a meta-analysis of 62,728 medical students pooled across 77 studies.[22] Our finding of a high prevalence of depression (51.05%) in medical students is consistent with the studies carried out in India 48.4%,[23] Iran 52.6%,[24] the USA 49%,[25] and Egypt 49.2%.[26] However, the prevalence of depression in this study was less than that among medical students of Syria and Egypt.[3,27,28] The variation of depression level measured in the above studies may be because of difference in the study population, methodology adopted, instruments used for the screening, low cutoff values used for the definition of depression, and socioeconomic background characteristics of the medical students.

In our study of students in the same setting, we found that Trinbagonian students were more depressed than the students from CARICOM and other nationality. However, we did not find any association of depressive symptoms with gender, year of study, and chronological age of the students. Our analysis showed that the prevalence of depression was lowest in the 1st-year medical students and that this increased in subsequent years. This may be attributable to the issues of increasing workload and pressure due to the examination.

The overall prevalence of anxiety in the present study was 63.14% among medical students. Similar studies from other countries showed a wide variety of rates; two studies in Egypt reported a prevalence anxiety rate of 78.4% and 66.4%.[27,28] The prevalence of anxiety in India was 66.9%;[14] in Brazil was 37.2%[18] and 19.5%;[29] in Syria was 35.1%;[3] and in Nepal was 41.1%.[30] The possible reason for this discrepancy might be the difference in the study population.

In our study, the prevalence of anxiety was higher among the female students compared to their male counterparts. This finding was consistent with those of other studies that have found that female students reported more prone to anxiety symptoms than males.[3,31] Our further analysis revealed that anxiety was significantly associated with the age of the students. Students aged between 22 and 24 years are more prone to stress compared to the students below 22 and above 25 years. It could not appropriately be explained by our study that why students of particular age group are more stressful than other age group.

The current study provided evidence of a high prevalence of psychological stress. The prevalence of stress in this study is in consistent with other studies conducted in different countries such as Brazil (47.1%)[18] and Ethiopia (52.4%),[32] but it is higher than what was reported in a study in Malaysia (42%).[33] However, the stress level in our study was less than that among medical students of Egypt (62.5%)[27] and Saudi Arabia (63.7%).[34] The current study revealed age difference in self-reported stress with significantly higher stress among students between 22 and 24 years compared to the students below 22 and above 24 years. However, two genders were not significantly

**Table 4: Association between stress and study variables**

| | Present, *n* (%) | Absent, *n* (%) | $\chi^2$ | *P* |
|---|---|---|---|---|
| Gender | | | | |
| Male | 65 (46.10) | 76 (53.90) | 0.381 | 0.537 |
| Female | 118 (49.37) | 121 (50.63) | | |
| Year of study | | | | |
| Year 1 | 65 (49.24) | 67 (50.76) | 2.626 | 0.269 |
| Year 2 | 58 (42.96) | 77 (57.04) | | |
| Year 3 | 60 (53.10) | 53 (46.90) | | |
| Age | | | | |
| Below 22 | 113 (49.56) | 115 (50.44) | 6.873 | 0.032 |
| 22-24 | 50 (54.35) | 42 (45.65) | | |
| 25 and older | 20 (33.33) | 40 (66.67) | | |
| Nationality | | | | |
| Trinbagonian | 170 (50) | 170 (50) | 4.556 | 0.102 |
| CARICOM | 10 (34.48) | 19 (65.52) | | |
| Others | 3 (37.5) | 8 (72.73) | | |
| Total | 183 (48.16) | 197 (51.84) | | |

different regarding stress. This is in consistent with a study conducted in a medical school in Syria.[3] Further, our study did not show any association of stress with year of study and nationality.

The current study reports several findings which point out mental health issue with high prevalence of psychological distress among medical students. The possible reasons of mental disturbance could be the excessive study hours, high academic demands, lack of time for leisure activities, lack of communication with the teaching staff, and high parental expectations.

### Limitation of the study

This study was based on self-reported information provided by students. Thus, there is a chance of bias which may have occurred because of the students' interpretation of the questions. Another limitation refers to the fact that our study included only pre- and para-clinical students. The inclusion of clinical students would result in a broader picture of the levels of psychological distress in medical students. Further, the tool (DASS) used in this study measured only the quantitative aspects of psychological disturbance and not the actual disorders which, indeed, would require a more extensive clinical psychological assessment procedure.

### Conclusions

The consequences of psychological distresses among medical students have a negative impact on students' academic and personal lives. Strong efforts are required for the medical institutions to address the psychological problems in medical students. A recommendation for the medical schools is to establish academic counseling center that helps identifying the mental illness among students and guides them accordingly to cope up with the issues related to mental health.

### Conflicts of interest

There are no conflicts of interest.

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