

# Mental Disorders among College Students in Vietnam: Evidence for Improving Coping Strategies

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## Abstract

**Context:** Mental disorders are highly prevalent worldwide, especially among university students. **Aims:** This study therefore aimed to explore the association between various demographic characteristics and depression, anxiety disorder, and stress. **Materials and Methods:** A cross-sectional study was conducted from September 2016 to June 2017 among college students in Southern Vietnam. The depression, anxiety, and stress scales (DASS-21) were used to measure the severity of the core symptoms of depression, anxiety, and stress. **Statistical Analysis Used:** The DASS-21 were used to measure the severity of the core symptoms of depression, anxiety, and stress. Results: There were 965 participants included in this study, with the study population comprising 53.6% of medical students and 46.4% of non-medical students. Based on the study findings, 928 students (96.2%) perceived the symptoms of the three disorders (i.e., depression, anxiety, and stress), while 307 students (31.8%) suffered an extremely severe level of the three disorders. In terms of depression, the participants' study plan ( $\chi^2 = 10.284$ ,  $P = 0.001$ ) and internet usage ( $\chi^2 = 6.076$ ,  $P = 0.001$ ) had a significant effect. For anxiety, the participants' study plan ( $\chi^2 = 6.091$ ,  $P = 0.013$ ) and school year ( $\chi^2 = 3.629$ ,  $P = 0.046$ ) were found to have an association. With regard to stress, the participants' field of study ( $\chi^2 = 5.900$ ,  $P = 0.015$ ), school year ( $\chi^2 = 5.102$ ,  $P = 0.013$ ), study plan ( $\chi^2 = 6.776$ ,  $P = 0.009$ ), and internet usage ( $\chi^2 = 11.807$ ,  $P = 0.001$ ) all proved to be influential. **Conclusions:** Coping strategies for psychological problems are hence recommended to focus on the study plans and internet usage of students.

**Key words:** Anxiety, Depression, Mental, Stress, Student, Vietnam

## INTRODUCTION

Mental health is fundamental to general health, and it is recognized by the World Health Organization (WHO) as “a state of well-being in which every individual realizes his or her own potential, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to her or his community.<sup>[1]</sup>” This implies that mental health is paramount to personal well-being and human relationships as well as being related to the development of countries. Unfortunately, common conditions such as depression and anxiety have proved difficult to manage and hence have become one of the largest contributors to global disability and death rates. Depressive disorders are increasingly prevalent worldwide. Indeed, they represented the leading cause of the disease burden for women in high-, middle-, and low-income countries in Africa,

Southeast Asia, and the Eastern Mediterranean in 2014.<sup>[2]</sup> In 2013, major depression and anxiety disorders, respectively, ranked second and seventh in the top ten causes of the global burden of diseases.<sup>[3]</sup> Further, the WHO's Global Burden of Disease Survey estimated that mental health conditions, including stress-related disorders, will be the second leading cause of disabilities by 2020, before moving into first place by 2030.<sup>[4,5]</sup>

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Despite the recognized impacts of depression, anxiety, and stress on various facets of life, the budget allocated for mental health around the world remains disproportionate to the associated burden.<sup>[6]</sup> As a result, the WHO has reported that between 76% and 85% of people with severe mental health disorders receive no treatment for their conditions. In Vietnam, per 100,000 residents, there are only 0.68 mental health professionals but 1991.<sup>[7]</sup> Mental disorder is related to disability-adjusted life years.<sup>[6]</sup> Even more concerning, a large-scale study conducted in the United Kingdom involving 16,460 undergraduate students revealed that at no time during university did the participants' psychological distress falls to pre-admission levels.<sup>[8]</sup> In Canada, 88.8% of undergraduate students were found to be feeling generally overwhelmed, while 70% of students in Pakistan reported relating to the symptoms of depression, and numerous statistics from China, Hong Kong, Thailand, and other Asian countries have provided an explicit warning about mental disorders in campus environments.<sup>[9-12]</sup> The high estimates regarding the prevalence of mental illness among college students may be due to difficulties in adapting to a new environment, taking responsibility for one's private life, achieving personal targets, and solving problems independently, without family support.<sup>[13-15]</sup> A large number of prior studies have demonstrated the relationship between mental health and various sociodemographic factors.<sup>[9,16,17]</sup>

It must also be recognized that studying at Vietnamese universities is frequently associated with a high level of pressure, high academic demands, and complex emotional changes during the transition to university.<sup>[18]</sup> In addition to transitional difficulties, Vietnamese students may suffer from excessive workloads, fear of academic failure, and challenges stemming from relatives' expectations. Therefore, the WHO has recommended that Vietnam combines psychological health within the primary health-care setting in the interests of internal consistency.<sup>[19]</sup> The main practical challenge concerns the fact that it is not possible to apply the available strategies used in developed countries in the Vietnamese context due to differences in culture, clinicians' bias and stereotyping, society service settings, and primary care or social misconceptions, which all have huge impacts on mental health.<sup>[20]</sup> Therefore, the present study aimed to (a) estimate the prevalence of depression, anxiety, and stress disorders among undergraduate students in Southern Vietnam, (b) analyze the correlation between various demographics and the level of mental illness, and (c) identify the factor(s) most responsible for each disorder and then orientate effective interventions.

## MATERIALS AND METHODS

### Study design and target population

This research study was designed as a cross-sectional descriptive analysis of mental disorders among college students in Southern Vietnam. The study was conducted from September 2016 to June 2017.

### Data collection

Our sampling procedure was designed based on the depression, anxiety, and stress scales (DASS-21), and it was conducted in a two-stage process using a questionnaire administered online through Kwik Surveys. During the first stage (which was considered to be the test stage), 117 undergraduate students were invited to participate in a test group and help to evaluate the intelligibility of the study instrument's language following translation. Their responses formed the basis for any necessary modifications, and they were used to check the reliability and validity of the questionnaire among undergraduate students. Next, the completed questionnaire was launched online in January 2017 and made available to the public for 1 month. The data collection process was carried out after the examination period so that academic stress would not affect the responses given by the students. All college students were eligible to participate in the study, and participation was entirely voluntary and anonymous. Some 1,137 students submitted responses, although only 965 questionnaires were found to be valid for the purposes of this study. Among the 168 excluded questionnaires, 77 replies were incomplete, nine were duplicates, and 73 were in an incorrect format. One advantage of choosing electronic administration was that the scoring was automated and available for the participants immediately after they submitted their responses.

### Instruments

#### Reliability test

Although the reliability of the DASS-21 has been tested in previous studies, none of those studies involved Vietnamese undergraduate students. In this study, internal consistency was examined for each subscale and then measured using Cronbach's alpha coefficient value. The testing process involving 117 volunteer students demonstrated the following results: Depression (Cronbach's  $\alpha = 0.90$ ), anxiety (Cronbach's  $\alpha = 0.84$ ), stress (Cronbach's  $\alpha = 0.80$ ), and the overall report, which included all the items, (Cronbach's  $\alpha = 0.93$ ). The statistical analysis not only indicated good internal consistency between the questions but also proved that no removal of any question could increase the total Cronbach's value. In other words, every item contributed to the general result so that no adjustment was needed. Such a result was completely consistent with the validation test performed in a previous study in Vietnam.<sup>[21]</sup> Based on these high estimates, the questionnaire is considered to be both stable and consistent.

#### Validity test

To date, there are 45 translations available for public download on the official DASS website, including a Vietnamese version translated by Tung Pham *et al.*<sup>[22]</sup> In the present study, a validity test was performed on their translated questionnaire to determine whether the target population is

capable of understanding the items and responding to them in an unbiased way. With the 117 participants in the test group, exploratory factor analyses were carried out to identify the dimensionalities of each scale. As shown in Table 1, each subscale presented only one significant dimension, which means that all seven questions associated with depression only contributed to one single factor (considered to be depressive symptoms) rather than presenting for anything else. Similarly, the seven questions associated with anxiety together support anxiety illness, while the stress-related questions only indicate the stress status. Therefore, no adjustments were needed.

### Scoring and interpretation of the DASS-21

The DASS-21 requires the students to rate each item based on the frequency of symptoms experienced over the previous week. There are four point levels, namely, “0” for students who did not experience the symptoms at all, “1” for students to whom the symptoms sometimes applied, “2” for those to whom the symptoms often applied, and “3” for the remaining students to whom the symptoms almost always applied.<sup>[23]</sup> Each question was initially coded by the letter D (depression), A (anxiety), or S (stress) to indicate which scale it belongs to. The sum of the scores for the identified questions in each scale was multiplied by two and then compared to the scoring scale to identify the level of disorder. Although the DASS-21 can be used by individuals, the interpretation should be made by an appropriately qualified health professional, for example, a clinical psychologist.

### Data analysis

The raw data from the online survey were summarized and analyzed using SPSS software (version 22.0). Based on the scoring scale of the DASS-21, the three levels of normal, mild, and moderate were categorized into the

first group, which was referred to as “absent,” while the two remaining levels (severe and extremely severe) were gathered into a second group referred to as “present.” In this study, descriptive statistics were used to summarize the sociodemographic characteristics and mental health status of the 965 participants. They were expressed in frequencies and percentages. Then, the association between the demographic factors and mental health was investigated using Chi-squared tests. Odds ratio (OR) was calculated to show up the prevalence of sick student in each group. Analytical results with a *P* value or significant value of 0.05 or less were considered to be statistically significant. After estimating the influence level of each factor, all significant items were entered into a logistic regression. The equation used in this analysis will be applied with regard to the mental health prognosis of undergraduate students.

### Ethical approval

The study protocol was approved by the University of Medicine and Pharmacy at Ho Chi Minh City.

## RESULTS

### Sociodemographic characteristics

Table 2 presents the seven investigated demographic characteristics, which consisted of three academic-related items and four habitual items. Among the 965 respondents, there were 517 (53.6%) medical students and 448 (46.4%) non-medical students. Of these, 26.4% were in their 1<sup>st</sup> and 2<sup>nd</sup> years of study, while the remaining 73.6% were seniors. With regard to study habits, 494 participants (51.2%) reported that they had a weekly study plan, while the others (48.8%) did not make a plan for the week. The duration

**Table 1: Factors' loading values in the validity test of the DASS-21**

Depression (KMO=0.88, significant<0.05, FE=4.35)		Anxiety (KMO=0.73, significant<0.05, FE=3.56)		Stress (KMO=0.78, significant<0.05, FE=3.21)	
Question	FL	Question	FL	Question	FL
Q3. No positive feeling	0.81	Q2. Dry mouth	0.55	Q1. Hard to wind down	0.63
Q5. No initiative	0.85	Q4. Breathing difficulty	0.70	Q6. Overreact	0.74
Q10. Expect nothing	0.76	Q7. Trembling	0.69	Q8. Nervous energy	0.66
Q13. Downhearted, blue	0.73	Q9. Panic, make fool of self	0.65	Q11. Agitated	0.72
Q16. Unable to become enthusiastic	0.69	Q15. Close to panic	0.81	Q12. Difficult to relax	0.74
Q17. Not worth much	0.87	Q19. Action of heart	0.76	Q14. Intolerant of delays	0.63
Q21. Life meaningless	0.79	Q20. Scared without reason	0.80	Q18. Touchy	0.62

FE: Factor's eigenvalue, FL: Factor loading

spent using the internet also differed among the students, with 45.4% using it for 5 h or more daily and 54.6% using it for <5 h per day. The number of students living in a dormitory or shared room was 570, accounting for 59.1% of the sample, while 395 reported living in a house, accounting for 40.9%. According to the statistics presented in Table 2, the difference in proportion between the students who did not have a part-time job ( $n = 613$ , 63.5%) and those who had a part-time job ( $n = 352$ , 36.5%) was nearly two-fold. The majority of the 965 participants did not drink beer or wine ( $n = 696$ , 72.1%), with only 269 students (27.9%) reporting that they drank.

### Prevalence of mental illness

Table 3 displays the severity distribution of the investigated mental disorders. The five levels of illness were classified into two groups, namely, “absent” and “present,” so that we could easily distinguish students who suffered obvious illness symptoms from others exhibiting vivid signals. Unfortunately, more than 90% of participants expressed symptoms associated with all three disorders, and most of them were at the severe or extremely severe level. More specifically, some 98.6%, 99.4%, and 96.9% of students, respectively, perceived the symptoms of stress, anxiety disorder, and depression. In particular, the number of students suffering an

extremely severe level of anxiety disorder was significantly high ( $n = 827$ ), accounting for some 85.7% of the sample. In addition, the high mean scores for the three mental illnesses represented strong evidence of the poor state of mental health within the university environment.

### Independent association between the demographic characteristics and each mental health disorder

Table 4 clearly displays the impact of the demographic characteristics on the students’ mental health. With regard to depression, there were two significant associations observed between the level of the illness’s presence and demographic factors. The first demographic factor was the students’ study plan ( $P = 0.001$ ,  $\chi^2 = 10.284$ ), while the second was the duration time of spent using the internet ( $P = 0.014$ ,  $\chi^2 = 6.076$ ). In more detail, the ratio between depression being perceived and depression not being perceived was 75.9 (98.7/1.3) among the students who did not have a weekly study plan and 19.4 (95.1/4.9) among the students who made a plan for the week. As a result, the OR was 3.9 (obtained by dividing 75.9 by 19.4), which showed that the risk of developing depressive disorder in students without weekly study plans was 4 times higher than that for students with weekly plans. By means of similar calculations, the OR between students using the internet for more than 5 h and students using the internet for <5 h was 2.8, which indicated that depression appeared more frequently in students who spent more time on the internet. The five remaining personal characteristics were found to have no association with mental health.

**Table 2: Sociodemographic characteristics of the students ( $n=965$ ,  $n$  [%])**

Characteristic	Value (%)
Field of study	
Medical student	517 (53.6)
Non-medical student	448 (46.4)
School year	
1 <sup>st</sup> and 2 <sup>nd</sup> year	255 (26.4)
Other years	710 (73.6)
Study plan	
Weekly plan	494 (51.2)
Monthly annual or no plan	471 (48.8)
Internet usage (hours per day)	
<5	527 (54.6)
≥5	438 (45.4)
Living place	
House	395 (40.9)
Shared room or dormitory	570 (59.1)
Part-time work	
Yes	352 (36.5)
No	613 (63.5)
Drinking beer	
Yes	269 (27.9)
No	696 (72.1)

When repeating the analysis in terms of stress, the strong correlation between the prevalence of the presence of illness and four demographic factors, namely, the study plan ( $P = 0.009$ ,  $\chi^2 = 6.776$ ) ( $\chi^2$ : Chi-square), internet usage ( $P = 0.001$ ,  $\chi^2 = 11.807$ ), field of study ( $P = 0.015$ ,  $\chi^2 = 5.900$ ), and school year ( $P = 0.027$ ,  $\chi^2 = 5.102$ ) was noted. In particular, all the students who used the internet for more than 5 h per day and all the 1<sup>st</sup> or 2<sup>nd</sup> year students presented with symptoms of stress disorder. Among the two groups, the  $\chi^2$  values were calculated using Fisher’s exact two-tailed test. Both the two OR values of perceived stress between the non-medical students and medical students and between the students with weekly plans and those without weekly plans were considerably high (5.3 and 5.8, respectively). These numbers convincingly indicated a more severe risk of suffering stress among the respondents who were non-medical, junior, did not have a weekly study plan and used the internet for more than 5 h daily. The other individual factors appeared to not be relevant to psychological disorders. Finally, considering anxiety, only one sociodemographic factor proved to be statistically significantly associated with the prevalence of the presence of illness. That factor was the study plan, with  $\chi^2 = 6.091$ ,  $P = 0.021$ , and OR = 8.7.

In brief, the demographic factors seen to influence the students’ psychiatric health were study plans (impact on three

**Table 3: Severity levels of the stress, anxiety, and depression scores (n=965, n [%])**

Severity level	Stress	Anxiety	Depression
	Value (%)	Value (%)	Value (%)
Absent	14 (1.4)	10 (1.0)	30 (3.1)
Normal	7 (0.7)	4 (0.4)	30 (3.1)
Mild	7 (0.7)	6 (0.6)	0 (0.0)
Present	951 (98.6)	955 (99.4)	935 (96.9)
Moderate	77 (8.0)	17 (1.8)	204 (21.1)
Severe	353 (36.6)	111 (11.5)	303 (31.4)
Extremely severe	521 (54.0)	827 (85.7)	428 (44.4)
Mean score (±SD)	16.8 (3.4)	13.5 (3.8)	13.6 (4.7)
Level of mean score	Severe or more	Extremely severe	Severe or more

**Table 4: Impact of sociodemographic characteristics on mental disorders**

Variable	Depression				Anxiety				Stress			
	Present n (%)	Absent n (%)	P value	OR**	Present n (%)	Absent n (%)	P value	OR**	Present n (%)	Absent n (%)	P value	OR**
Field of study												
Medical students	496 (95.9)	21 (4.1)	0.067	2.065	509 (98.5)	8 (1.5)	0.117	3.505	505 (97.7)	12 (2.3)	0.015	5.299
Non-medical students	448 (98.0)	9 (2.0)			446 (99.6)	2 (0.4)			446 (99.6)	2 (0.4)		
School year												
First and second year	251 (98.4)	4 (1.6)	0.099	0.419	255 (100)	0 (0.0)	0.071		255 (100.0)	0 (0.0)	0.027	
Other years	684 (96.3)	26 (3.7)			700 (98.6)	10 (1.4)			696 (98.0)	14 (2.0)		
Study plan												
Weekly plan	470 (95.1)	24 (4.9)	0.001	3.957	485 (98.2)	9 (1.8)	0.021	8.722	482 (97.6)	12 (2.4)	0.009	5.838
Monthly or annual plan	465 (98.7)	6 (1.3)			470 (99.8)	1 (0.2)			469 (99.6)	2 (0.4)		
Living place												
House	282 (97.9)	6 (2.1)	0.231	0.579	286 (99.3)	2 (0.7)	0.732	0.585	286 (99.3)	2 (0.7)	0.251	0.388
Shared room or dormitory	653 (96.5)	24 (3.5)			669 (98.8)	8 (1.2)			665 (98.2)	12 (1.8)		
Part-time work												
Yes	337 (95.7)	15 (4.3)	0.118	1.774	347 (98.6)	5 (1.4)	0.510	1.752	345 (98.0)	7 (2.0)	0.290	1.757
No	598 (97.6)	15 (2.4)			608 (99.2)	5 (0.8)			606 (98.9)	7 (1.1)		
Drinking beer or wine												
Yes	264 (98.1)	5 (1.9)	0.164	0.508	267 (99.3)	2 (0.7)	0.735	0.644	266 (98.9)	3 (1.1)	0.768	0.702
No	671 (96.4)	25 (3.6)			688 (98.9)	8 (1.1)			685 (98.4)	11 (1.6)		
Internet usage (hours per day)												
5	504 (95.6)	23 (4.4)	0.014	2.809	519 (98.5)	8 (1.5)	0.123	3.356	513 (97.3)	14 (2.7)	0.001	
≥5	431 (98.4)	7 (1.6)			436 (99.5)	2 (0.5)			438 (100.0)	0 (0.0)		

$$P^*: \text{Fisher's exact two-tailed test, } **OR = \frac{P_{\text{present2}}}{P_{\text{absent2}}} \div \frac{P_{\text{present1}}}{P_{\text{absent1}}}$$

disorders), internet usage (impact on depression and stress), and field of study and school year (impact on stress), whereas

the remaining factors did not have an impact on the students' mental status.

### Combination of remarkable factors

It became clear that individual variables were separately associated with each disorder, which meant that we continued to investigate the relationship between the four identified characteristics and the prevalence of developing the three disorders at an extremely severe level. According to the statistics, some 521 students (54.0%) suffered extremely severe stress. Further, 497 of the 521 (95.4%) had extreme anxiety disorder and 307 of the 497 (61.8%) had extremely severe depression. Consequently, among the 965 undergraduate participants in this study, 307 students (31.8%) suffered from three extremely severe disorders. Such a poor health status was found to be significantly associated with the students' study plans ( $\chi^2 = 9.388, P = 0.002$ ), school year ( $\chi^2 = 11.758, P = 0.001$ ), and internet usage ( $\chi^2 = 12.687, P = 0.000$ ), as shown in Table 5. Finally, these three variables were entered into a logistic regression model to establish a predictive equation. The study-related variables, namely, school year ( $P = 0.001$ ), study plan ( $P = 0.016$ ), and internet usage ( $P = 0.002$ ) were found to be independent risk factors for the investigated outcome. The equation can be given as follows:

$$\ln\left(\frac{P}{1-P}\right) = 0.507 - 0.514 \times \text{School year} + 0.343 \times$$

Study plan + 0.442 × Internet usage

Where  $P$  is the probability of not suffering from the three mental health disorders at an extremely severe level [Table 6].

## DISCUSSION

### The unequal distribution of mental disorders

The prevalence of stress, anxiety, and depression symptoms among college students in Vietnam was found to be more than 90%. This result is much higher than the results found in other countries. In fact, the percentage of participants in previous health surveys found to be suffering from mental illness symptoms is unequal between continents, ranging from 20% among the America to 40% in Europe and 70% in Asia. More specifically, the lowest identified percentage was 25% in the United States and Canada,<sup>[24]</sup> which increased to 43% in Central and Eastern European<sup>[25]</sup> and finally rose to 70% in Pakistan.<sup>[9]</sup> This uneven occurrence of mental illness might be explained by the different distributions of resources between regions. According to the WHO report, the budget for mental health in Southeast Asia was 66.7%, compared to 92.6% in the America and 80% in the Eastern Mediterranean. The availability of treatment facilities for severe mental disorders in the primary care system of Southeast Asia was 44%, which was the lowest level of availability seen worldwide, being much lower than the primary care sources available in the America (66.7%) and Europe (65.3%).<sup>[26]</sup> In addition, one remarkable point

concerns the fact that the data utilized in this study were mainly collected from students in Ho Chi Minh City, one of the most competitive and populous cities in Vietnam, which suggests that the prevalence of depression was found to be higher than in other areas. Indeed, previous reports have presented concerning statistics about the mental health of students in Ho Chi Minh City, for example, 73.1% of students were found to suffer from mental disorders due to stringent study programs, while 69.2% blamed their mental disorders on examination preparations.<sup>[27]</sup>

### Understanding the significant associations of stress, anxiety, and depression

Many types of stressors can contribute to the disordered state of individual students, including economic conditions, sociodemographic characteristics such as age, gender, marriage status, and social network, as well as academic factors such as school year, examinations, point average, and competitive rate in skills training.<sup>[28]</sup> However, university-related causes are more likely to adjust and eventually offer support for students. In this study, the higher rate of mental disorder found to exist among 1<sup>st</sup>- and 2<sup>nd</sup>-year students could be explained by various changes and unpredictable occurrences during the initial period of life as an undergraduate student. Adaptation processes take place when students enter university living accommodation, encounter financial difficulties, and separate from familial support, all of which mean taking responsibility for their own decisions.<sup>[29]</sup> Such external pressures can subject freshmen to mental strain or even cause severe damage to students' spiritual life. Based on prior studies, time management among students is particularly poor; therefore, using weekly plans is believed to help construct good study habits for students and support them in diminishing stress and anxiety.<sup>[30]</sup> Moreover, the association between study plans and mental disorders is consistent between this study and a previous study conducted in Vietnam, which illustrated the important impact of study plans on students over a 6-year period.<sup>[19]</sup> Finally, the duration of internet usage also exhibited a significant relation to psychological health. Students who use the internet for more than 5 h per day have a higher risk of becoming internet dependent or even additive internet users. Many prior studies have shown that excessive use of the internet will reduce the time spent with family, friends, and face-to-face appointments, which narrows both one's social network and communication.<sup>[31]</sup> As a result, a disruption to normal life might occur and cause depressive disorder or interpersonal sensitivity, which decreases one's ability to control life. The three remarkable mental disorders frequently observed among college students are depression, anxiety, and stress.<sup>[32]</sup> Hence, it is clear that the duration of internet usage is significantly associated with the prevalence of such mental disorders.

### Pressure among fields of study

Many prior studies have presented results indicating that medical students experience more pressure than other

**Table 5:** Associations between the demographic factors and the rate of developing three extremely severe disorders (*n*=386)

Variable	Present <i>n</i> (%)	Absent <i>n</i> (%)	$\chi^2$ value	<i>P</i> value
Field of study				
Medical students	160 (30.9)	357 (69.1)	0.385	0.535
Non-medical students	147 (32.8)	301 (67.2)		
School year				
1 <sup>st</sup> and 2 <sup>nd</sup> year	103 (40.4)	152 (59.6)	11.758	0.001
Other years	204 (28.7)	506 (71.3)		
Study plan				
Weekly plan	135 (27.3)	359 (72.7)	9.388	0.002
Monthly or annual plan	172 (36.5)	299 (63.5)		
Internet usage (hours per day)				
<5	142 (26.9)	385 (73.1)	12.687	0.000
≥5 h daily	165 (37.7)	273 (62.3)		

**Table 6:** Logistic regression analysis (*n*=386)

Variables	B	<i>P</i> value	Adjusted OR	95% Confidence interval
School year	-0.514	0.001	0.598	0.442–0.808
Study plan	0.343	0.016	1.409	1.066–1.862
Internet usage	0.442	0.002	1.556	1.178–2.056
Constant	0.507	0.000		

students. This is because of the large amount of information input and pressure directly related to human life.<sup>[24,33]</sup> Moreover, a lack of social network relationships and the high risk of debt after graduation represent significant worries for numerous medical students, especially those who have a humble financial status.<sup>[34]</sup> In Spain, the prevalence of medical students suffering from emotional disturbances was 30%, which was higher than that found for other fields of study.<sup>[35]</sup> On the contrary, this research study found no differences in terms of experiencing mental disorders between medical students and students in other fields. Such a result could be explained by the fact that the level of academic pressure was unequal among colleges in the same field, which meant that students studying for the same major might suffer different levels of stress and anxiety. In addition, the health-care provision in private universities has more resources and exhibits more concern than that in public colleges, which provides students with more convenient and effective access to primary health treatment. As a result, the data collected from both types of colleges eliminated all the differences among the different fields of the study.

### Role of the logistic regression model

In this study, both the dependent variables (prevalence of perceiving stress, anxiety, and depression) and three independent variables (school year, study plan, and internet

usage) were identified as binary categorical variables. They were entered into a logistic regression analysis and then used to estimate the probability of a binary response based on the presence of certain factors. In addition, logistic regression was also regarded as a tool for establishing a predictive equation.<sup>[36,37]</sup> In this study, the predictors (school year, study plan, and internet usage) only had two values, “0” and “1,” which represent the two groups of predictors. In terms of the school year, “1” was used for 1<sup>st</sup>- and 2<sup>nd</sup>-year participants and “0” for the others. Concerning the study plan, “1” inferred that the students had weekly plans, while “0” indicated the others. Likewise, students who used the internet for <5 h daily were regarded as “1,” whereas “0” was used for the others. The predictive equation offered a percentage of correct answers of approximately 70%; therefore, health-care workers can use it to estimate the risk of mental illness among students. For instance, if a student is in the 1<sup>st</sup> year (school year = 1), does not have a weekly study plan (study plan = 0), and uses the internet for more than 5 h daily (internet usage = 0), the probability of suffering three extremely severe illnesses (1-p) is 50.2%. However, if that student is in the final year (school year = 0), has a weekly study plan (study plan = 1), and uses the internet for <5 h daily (internet usage = 1), then the probability of suffering three extremely severe illnesses (1-p) is 21.6%. In this way, the predictive equation can support careers counselors or lecturers in achieving an early diagnosis as well as assist in the primary risk estimation of students’ mental illness.

## LIMITATIONS

This study had a number of limitations. First, the data collection process was launched online and lasted for only 1 month, which meant that this study could not reach all colleges students. It also resulted in some challenges when verifying information provided by the participants. Second, the study concentrated on just seven demographic characteristics, consisting of both academic factors and habitual elements; hence, the predictive equation is not totally accurate.

## CONCLUSION

The prevalence of college students in Vietnam who suffer from mental disorders was found to be approximately 90%. Such an alarming finding strongly indicates an urgent need for the implementation of an intensified and enhanced psychological management program. The school year, study plan, and duration of internet usage were all significantly associated with stress, anxiety, and depression. Hence, these three factors need to be thoroughly considered during the initial diagnostic process. The recommended means of avoiding poor mental health status are making weekly study plans, limiting the amount of time spent on the internet, and confiding in friends, family, or counselors about any challenges faced.

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## REFERENCES

1. Shaw TE, Currie GP, Koudelka CW, Simpson EL. Eczema prevalence in the united states: Data from the 2003 national survey of children's health. *J Invest Dermatol* 2011;131:67-73.
2. World Health Organization. *Global Burden Disease\_Report\_2004 Update*. Geneva: World Health Organization; 2004.
3. Vigo D, Thornicroft G, Atun R. Estimating the true global burden of mental illness. *Lancet Psychiatry* 2016;3:171-8.
4. Christodoulou GN. *DEPRESSION: A Global Crisis*. Geneva: WHO; 2012.
5. WHO. *The Global Burden of Disease: A Response to the Need for Comprehensive, Consistent and Comparable Global Information on Diseases and Injuries*. Geneva: WHO; 2003.
6. Organization WH. *MhGAP: Mental Health Gap Action Programme: Scaling up care for Mental, Neurological and Substance use Disorders*. Geneva: WHO; 2008.
7. World Health Assembly. *Global Burden of Mental Disorders and the Need for a Comprehensive, Coordinated Response from Health and Social Sectors at the Country Level: Report by the Secretariat*; 2012.
8. Bewick B, Koutsopoulou G, Miles J, Slaa E, Barkham M. Changes in undergraduate students' psychological well-being as they progress through university. *Stud Higher Educ* 2010;35:633-45.
9. Khan MS, Mahmood S, Badshah A, Ali SU, Jamal Y. Prevalence of depression, anxiety and their associated factors among medical students in Karachi, Pakistan. *J Pak Med Assoc* 2006;56:583-6.
10. Garlow SJ, Rosenberg J, Moore JD, Haas AP, Koestner B, Hendin H, *et al*. Depression, desperation, and suicidal ideation in college students: Results from the american foundation for suicide prevention college screening project at Emory University. *Depress Anxiety* 2008;25:482-8.
11. Keyes CL, Eisenberg D, Perry GS, Dube SR, Kroenke K, Dhingra SS, *et al*. The relationship of level of positive mental health with current mental disorders in predicting suicidal behavior and academic impairment in college students. *J Am Coll Health* 2012;60:126-33.
12. Cuttilan AN, Sayampanathan AA, Ho RC-M. Mental health issues amongst medical students in Asia: A systematic review [2000–2015]. *Ann Trans Med* 2016;4:72.
13. Sokratous S, Merkouris A, Middleton N, Karanikola M. The association between stressful life events and depressive symptoms among Cypriot university students: A cross-sectional descriptive correlational study. *BMC Public Health* 2013;13:1121.
14. Verger P, Combes JB, Kovess-Masfety V, Choquet M, Guagliardo V, Rouillon F, *et al*. Psychological distress in first year university students: Socioeconomic and academic stressors, mastery and social support in young men and women. *Soc Psychiatry Psychiatr Epidemiol* 2009;44:643-50.
15. Dyson R, Renk K. Freshmen adaptation to university life: Depressive symptoms, stress, and coping. *J Clin Psychol* 2006;62:1231-44.
16. Ali Talaei AR, Saghebi A. A survey of depression among Iranian medical students and its correlation with social support and satisfaction. *J Pak Psychiatric Soc* 2008;5:90.
17. Kaya M, Genç M, Kaya B, Pehlivan E. Prevalence of depressive symptoms, ways of coping, and related factors among medical school and health services higher education students. *Turk Psikiyatri Derg* 2007;18:137-46.
18. Dat NNB. Psychological treatment in depression. *Journal of Psychology* 2002;11:37-40.
19. Thuan LM. *Psychical disorders in medical student: A survey in the University of Medicine and Pharmacy at Ho Chi Minh City*. Thesis 2011.
20. Lawrence KM, Noonan A, Miranda J, *et al*. *Mental Health: Culture, Race, and Ethnicity*. Rockville, MD:

- Department of Health and Human Services; 2001.
21. Tran TD, Tran T, Fisher J. Validation of the depression anxiety stress scales (DASS) 21 as a screening instrument for depression and anxiety in a rural community-based cohort of northern Vietnamese women. *BMC Psychiatry* 2013;13:24.
  22. Pham T. Pham DASS21 Vietnamese translation 2014. Available from: <http://www2.psy.unsw.edu.au/Groups/Dass/Vietnamese/Pham.htm>. [Last Accessed on 2016 Jan 25].
  23. Gomez F. A guide to the depression, anxiety and stress scale (DASS 21). *Open J Epidemiol* 2015;5:260-8.
  24. Firth J. Levels and sources of stress in medical students. *Br Med J (Clinical research ed)* 1986;292:1177-80.
  25. Wardle J, Steptoe A, Gullis G, Sartory G, Sèk H, Todorova I, *et al.* Depression, perceived control, and life satisfaction in university students from central-eastern and western Europe. *Int J Behav Med* 2004;11:27-36.
  26. Saraceno B, Saxena S. Mental health resources in the world: Results from project atlas of the WHO. *World Psychiatry* 2002;1:40-4.
  27. Study Finds Significant Stress, Anxiety Among Vietnamese Students. *Thanh Nien News*; 2014.
  28. Ng KH, Agius M, Zaman R. The global economic crisis: Effects on mental health and what can be done. *J R Soc Med* 2013;106:211-4.
  29. Ahmed I, Banu H, Al-Fageer R, Al-Suwaidi R. Cognitive emotions: Depression and anxiety in medical students and staff. *J Crit Care* 2009;24:e1-7.
  30. Shahidi F, Dowlatkah HR, Avand A, Musavi SR, Mohammadi E. A study on the quality of study skills of newly-admitted students of Fasa University of medical sciences. *J Adv Med Educ Prof* 2014;2:45-50.
  31. Iskender M. Internet addiction and depression, anxiety and stress. *Int Online J Educ Sci* 2011;3:138-48.
  32. Babadi-Akashe Z, Zamani BE, Abedini Y, Akbari H, Hedayati N. The relationship between mental health and addiction to mobile phones among university students of Shahrekord, Iran. *Addict Health* 2014;6:93-9.
  33. Supe AN. A study of stress in medical students at Seth G.S. Medical college. *J Postgrad Med* 1998;44:1-6.
  34. Sayampanathan AA, Tan YT, Fong JM, Koh YQ, Ng CL, Mohan N, *et al.* An update on finances and financial support for medical students in Yong loo Lin school of medicine. *Singapore Med J* 2017;58:206-11.
  35. Sender R, Salamero M, Vallés A, Valdés M. Psychological variables for identifying susceptibility to mental disorders in medical students at the university of Barcelona. *Med Educ Online* 2004;9:4350.
  36. Tabaei BP, Herman WH. A multivariate logistic regression equation to screen for diabetes: Development and validation. *Diabetes Care* 2002;25:1999-2003.
  37. Obeso JM, García P, Martínez B, Arroyo-López FN, Garrido-Fernández A, Rodríguez A, *et al.* Use of logistic regression for prediction of the fate of *Staphylococcus aureus* in pasteurized milk in the presence of two lytic phages. *Appl Environ Microbiol* 2010;76:6038-46.

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