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Neurotic Personality Traits and Depression among First Year Medical and Dental Students in Universiti Sains Malaysia

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Abstract

Objective: This study aims to evaluate the association of neurotic personality traits and coping styles with depression amongst first year medical and dental students. Methods: A total of 167 students consisting of 133 medical and 34 dental students in their first year were recruited. All the subjects were assessed using BDI, NEO PI-R (N) and Brief COPE for depression, neurotic personality traits and coping styles respectively. Result: First year dental students were 3 times more likely to have depression than first year medical students. Students who scored high and very high on the total Neuroticism factor and the Depression facet of NEO PI-R (N) were 3.6 times and 7 times more likely to have depression than students who scored very low, low or average for the above scales. All coping styles and other socio-demographic factors showed no association with depression. Conclusion: Neurotic personality traits are significantly associated with depression. NEO PI-R (N) proved to be a useful tool to evaluate the neurotic traits among medical and dental students allowing early interventional measures to those who need it.

Keywords: Neurotic Personality Traits, Depression, Coping Style, Medical Student, Dental Student

Introduction

It is well known that the neurotic personality trait is a premorbid risk factor for developing a depressive disorder[1]. People who score high in neuroticism are emotionally reactive and susceptible to stress. They are more likely to interpret normal events as threatening, and trivial frustrations as hopelessly unmanageable. Their negative emotional reactions are more likely to persist for unusually long periods of time, which implies that they are regularly in a bad mood. There is a significant association between neuroticism and depression[2]. Individuals with high neuroticism reacted more negatively to the stressors and were more vulnerable to the recurrence of the same stressors[3].

Coping styles have been shown to be a significant contributor to the development of depression[4,5]. Problem-focused coping appears to be the most adaptive coping style

as it is associated with alleviated psychological distress. Avoidant coping seems to be the most maladaptive as it is associated with increased distress[4-10]. The emotion-focused coping have mixed results as this coping style has been associated with both increased and decreased levels of psychological distress[4-9,11].

Previous studies have shown that one eighth to one quarter of medical students were depressed[12-14]. First year medical students were found to be under more intense pressure and stress particularly when compared with final year medical students[15]. They seemed to be more heavily burdened by the academic curriculum, and the perceived stress might be the result of the process of adjusting to life in the new educational settings. The prevalence of depressive disorders amongst first year medical students doubled between the beginning and the end of their first year[16,17].

Similarly in Malaysia[18], the prevalence of psychological stress is highest among first year medical students at 48.6% and 4th year at 48.7%, followed by 5th year at 41.4%, 2nd year at 39.7% and 3rd year medical students at 29.8%. In another study[19] 46.2% of medical students suffer from emotional disorders.

Realizing the importance of this issue, this study was conducted to evaluate the association between neurotic personality traits and coping styles with depressive symptoms among first year medical and dental students. Personality traits are relatively stable over time. In contrast, coping styles are less stable as they may change as the students mature and learn to adapt. Evaluating personality traits and coping styles allows for early identification of those who are vulnerable to develop depression whether now as a student or later on after graduating from medical school.

Methods

Subject

A total of 167 out of 257 first year (208 medical and 49 dental) students from Universiti Sains Malaysia (USM) were enrolled into the study after signing the consent form. This was 64% (133) and 69% (34) of first year medical and dental student respectively. In USM, the curriculum is such that both medical and dental students were in the same class for the first 3 years of their course work. In addition, dental students are also required to attend dental practical. Altogether there were 257 first year students. Amongst the 208 medical students, 176 were new and 32 were repeat students. Amongst the 49 dental students, 40 were new and 9 repeat students.

Assessment

The Revised NEO Personality Inventory (NEO PI-R) measures the 5 domains of personality and 30 more specific facets, with 6 facets hierarchically structured under each of the 5 domains. The inventory includes 240 items, with 8 items per facet, with domain scale scores computed through aggregation of its composing facets. Only the Neuroticism factor was assessed in this study. The item response scale ranged from 1 (strongly agree) to 5 (strongly disagree). The results were summarized in terms of 5 levels: very low, low, average, high, and very high. The cut-off score between high and average for anxiety, angry/hostility, depression, self-consciousness, impulsiveness and vulnerability to stress are 17, 16, 16, 17, 16 and 13 respectively

The brief COPE consists of 28 items with response scale ranged from 1 (never) to 4 (frequently). It measures 14 coping

responses grouped under 3 domains which are problem-focused (active coping, use of instrumental support, planning, and positive reframing), emotion-focused (use of emotional support, venting, humor, acceptance and religion) and avoidant coping (self-distraction, denial, substance use, behavioral disengagement and self-blame)[20].

The Beck Depression Inventory Second Edition (BDI-II) is a 21-item self-reported tool aimed to assess the presence and severity of symptoms of depression. When presented with the BDI-II, the students were asked to consider each statement as it relates to the way they have felt for the past two weeks. It is a good instrument for screening depressive disorders in community surveys. The predictive value of the selected cut-off point (12/13) was 100% sensitivity, 99% specificity, 0.72 PPV, 1 NPV, and 98% overall diagnostic value[21].

All questionnaires were given at one sitting to all the students after explaining the study protocol during the rest time between two lectures in May 2011 by the first author. Students with a known severe mental disorder were excluded from the study.

Statistical Analysis

Pearson chi-square test and Fisher exact test were used to compare socio-demographic characteristic between medical and dental groups. To further analyze the data, a series of hierarchical regression analyses were conducted. All the analyses were done using SPSS 17.0 for Windows.

Results

A total of 167 subjects (128 medical students and 39 dentistry students) were successfully recruited for analysis. The high number of non-responders (about 35% of 257 students) may be due to the timing of recruitment which was done in between lectures when some of the students may have gone for tea break.

Depression among the first year medical and dental students was 18.8% and 41.2% (p=0.011) respectively which was statistically significant. Otherwise, as shown in table 1, variables such as batch, gender, race, religion, hometown, family history of mental illness and financial aid between the medical and dental students were no different.

Table 1. Characteristics of first year medical and dental students

		Student Type		*P value*
		Medical	Dental	
Student Batch	New	118(80.3%)	29 (19.7%)	0.562
	Repeat	15(75.0%)	5 (25.0%)	
Gender	Male	30 (85.7%)	5 (14.3%)	0.316
	Female	103(78.0%)	29(22.0%)	
Race	Malay	63(77.8%)	18 (22.2%)	0.562
	Non-Malay	70(81.4%)	16 (18.6%)	
Religion	Muslim	66(77.6%)	19 (22.4%)	0.515
	Non-Muslim	67(81.7%)	15 (18.3%)	
Hometown	Kelantan	17(85.0%)	3(15.0%)	0.768
	Other States	116(78.9%)	31 (21.1%)	
Family History of Mental Illness	Negative	125(79.6%)	32(20.4%)	>0.95
	Positive	7(77.8%)	2(22.2%)	

Financial Aid	Loan	24(85.7%)	4(14.3%)	0.036
	Scholarship	96(82.1%)	21(17.9%)	
	None	11(57.9%)	8(42.1%)	

Simple logistic regression (Table 2) showed 1 socio-demographic characteristic (i.e., type of student), 3 coping styles (i.e., venting, denial and self-blame), and all NEO facets except impulsivity were the potential associated factors for depression. Further analysis with multiple logistic regressions (Table 3) was performed. Only type of student, NEO depression facet and NEO neuroticism factor remained significantly associated with depression.

Table 2. Associated factors of Depression among First Year Medical and Dental Students by Simple Logistic Regression Model

Variables	Regression Coefficient (b)	Crude Odds Ratio (95% CI)	Wald Statistic	*p*-value
Type of student				
Medical	0	1		
Dental	1.107	13.024 (1.346 , 6.796)	7.174	0.007
Student Batch				
New	0	1		
Repeat	0.660	1.935 (0.713, 5.254)	1.678	0.195
Gender				
Male	0	1		
Female	-0.163	0.850 (0.359, 2.009)	0.138	0.711
Race				
Malay	0	1		
Chinese	-0.512	0.599 (0.275, 1.304)	1.668	0.196
Indian and others	0.868	2.381 (0.658, 8.621)	1.746	0.186
Religion				
Islam	0	1		
Christian	-1.088	0.337 (0.072, 1.581)	1.902	0.168
Buddhist	-0.372	0.690 (0.305, 1.561)	0.795	0.373
Hindu	0.075	1.078 (0.195, 5.951)	0.007	0.931
Others	0.028	1.348 (0.117, 15.583)	0.057	0.811
Hometown				
Kelantan	0	1		
Other Pen. States	0.021	0.903 (0.302, 2.705)	0.033	0.856
East Malaysia	0.035	1.250 (0.292, 5.348)	0.091	0.764
Financial aid				
Negative	0	1		
Positive	-0.723	0.485 (0.177, 1.335)	1.961	0.161
Family history of mental illness				

Negative	0	1		
Positive	-0.938	0.391 (0.047, 3.231)	0.759	0.384
Active Coping				
Never/Rarely	0	1		
Occasionally/Frequently	0.305	1.357 (0.366, 5.027)	0.208	0.648
Instrumental support				
Never/Rarely	0	1		
Occasionally/Frequently	-0.095	0.909 (0.424, 1.951)	0.060	0.807
Positive Reframing				
Never/Rarely	0	1		
Occasionally/Frequently	0.422	1.525 (0.486, 4.786)	0.524	0.469
Planning				
Never/Rarely	0	1		
Occasionally/Frequently	0.857	2.355 (0.663, 8.364)	1.755	0.185
Emotional support				
Never/Rarely	0	1		
Occasionally/Frequently	-0.169	0.844 (0.392, 1.817)	0.187	0.665
Venting				
Never/Rarely	0	1		
Occasionally/Frequently	1.025	2.786 (1.323, 5.864)	7.276	0.007
Humour				
Never/Rarely	0	1		
Occasionally/Frequently	0.108	1.114 (0.532, 2.333)	0.082	0. 774
Acceptance				
Never/Rarely	0	1		
Occasionally/Frequently	0.121	1.128 (0.298, 4.266)	0.032	0.859
Religion				
Never/Rarely	0	1		
Occasionally/Frequently	0.053	1.055 (0.416, 2.675)	0.013	0.910
Self-distraction				
Never/Rarely	0	1		
Occasionally/Frequently	0.838	2.313 (0.944, 5.667)	3.361	0.067
Denial				
Never/Rarely	0	1		
Occasionally/Frequently	0.976	2.654 (1.037, 6.794)	4.141	0.042
Substance Use				
Never/Rarely	0	1		
Occasionally/Frequently	-20.022	0.000 (0.000, 0.000)	0.000	>0.950
Behavioural Disengagement				
Never/Rarely	0	1		
Occasionally/Frequently	-0.017	0.983 (0.257, 3.767)	0.001	0.980
Self-blame				
Never/Rarely	0	1		
Occasionally/Frequently	1.264	3.540 (1.681, 7.456)	11.062	0.001

NEO Anxiety				
Very Low/Low/Average High/Very High	0 1.462	1 4.312 (2.031, 9.158)	14.467	<0.001
NEO Anger/Hostility				
Very Low/Low/Average High/Very High	0 1.109	1 3.031 (1.410, 6.518)	8.063	0.005
NEO Depression				
Very Low/Low/Average High/Very High	0 2.762	1 15.833 (6.088, 41.177)	32.083	<0.001
NEO Self-consciousness				
Very Low/Low/Average High/Very High	0 1.132	1 3.103 (1.467, 6.565)	8.774	0.003
NEO Impulsivity				
Very Low/Low/Average High/Very High	0 0.564	1 1.758 (0.613, 5.040)	1.101	0.294
NEO Vulnerability				
Very Low/Low/Average High/Very High	0 1.447	1 4.251 (2.002, 9.029)	14.185	<0.001
NEO Total Neuroticism factor				
Very Low/Low/Average High/Very High	0 2.248	1 9.473 (4.143, 21.659)	28.399	<0.001

Table 3. Associated factors of Depression among First Year Medical and Dental Students by Multiple Logistic Regression Model

	Regression Coefficient (B)	Adjusted Odds Ratio (95% CI)	p value
Student Type	1.120	3.1 (1.12, 8.36)	0.029
NEO Depression facet	1.944	7.0 (2.27, 21.49)	0.001
NEO Neuroticism factor	1.292	3.6 (1.26, 10.50)	0.017

There is no multicollinearity between variables since correlation is < 0.9, ie. (-0.844), (-0.236) and (-0.368) for Type of Student, Depression facet of NEO and Total NEO Neuroticism factor respectively.
Model is satisfactory as Hosmer-Lemeshow Goodness-of-fit showed p value 0.764 which is > 0.05. Overall percentage of 79.6% (>70%) indicates that this model is significant.
ROC Curve: Area under ROC curve is 0.839 (> 0.7) indicates that findings are significant.

In summary, the dental students have 3.1 times the odds (chance) to develop depression compared to the medical students when other confounders were adjusted. Students who scored high and very high on NEO depression facet of have 7.0 times the odds (chance) to develop depression compared to students scored average, low or very low when other confounders were adjusted. Students who scored high and very high on NEO neuroticism factor have 3.6 times the odds (chance) to develop depression compared to students scored average, low or very low when other confounders were adjusted.

Discussion

Although attending university is generally viewed as a positive experience, which offers many new opportunities, it nonetheless sometimes involves a stressful period of adaptation for students. They have to adapt to the demands of this new situation, whether it be their living conditions, different style of teaching, their lifestyle or responsibilities. For a large majority of students, going to university is also the first time that they spend a long, often definitive, period away from their families. These changes may produce a high stress level that supports the onset of psychological problems.

This study found depression was present in 18.8% and 41.2% (p=0.011) of first year medical and dental students respectively. This finding corresponds to the prevalence from a previous longitudinal cohort study in Newcastle, England by Newbury-Birch et al, 2002 which discovered that 47% of the dental student cohort as second year students, 67% as final year students and 16% as dentists suffered from possible pathological anxiety, compared with 47%, 26% and 30% in the medical student cohort[22]. A greater proportion of dental students were similarly found to be drinking at hazardous levels at all three time-points in their 2nd year, final year and as dentists, compared with medical students. The proportion of dental students in Newcastle drinking above the recommended low risk limits of alcohol declined from 47% as second year students to 25% as final year students and then it increased to 41% as qualified dentists, while in medical students it steadily increased over the three time points of the survey at 33%, 43% and 54%[22]. This may also indicate the academic stress and workload amongst dental is higher during the beginning of their course whereas stress among medical students becoming increasingly high during their final year and as interns.

When all the independent variables were entered into the multiple logistic regression equation, no association could be found between depression and other socio-demographic variables such as student batch, gender, race, religion, hometown, family history of psychiatric illness and financial aid.

Coping styles have been associated with depression. However in this study, all coping styles were found to have no association with depression whether inversely or otherwise. The absence of the association between depression and certain coping styles may be considered as negating important confounders with regards to proving that only neurotic personality traits are associated with depression, regardless of whichever coping styles applied in one's life. The results of this study failed to replicate the findings from previous studies such as the 10 year longitudinal study by Holahan et al, 2005[23] that avoidant coping was positively associated with depressive symptoms, and Wijndaele et al, 2007[5] which

claimed that problem-focused coping tend to reduce symptoms of stress, anxiety and depression, compared to subjects who used other coping styles.

Neurotic personality traits when measured with NEO PI-R are subdivided into 6 facets comprising of anxiety, anger/hostility, depression, self-consciousness, impulsivity and vulnerability. In this study, all the facet are not associated with depression except the depression facet whereby students who scored high or very high on the depression facet of NEO PI-R were 7 times more likely to develop depression as compared to students who scored very low, low or average on this facet. This indicates that the depression facet among all neurotic personality traits is strongly and specifically associated with depression. This finding is partially similar to the discovery by Chioqueta et al, 2005 which revealed that depressive symptoms were positively predicted by the anger/hostility and depression facets[24]. However in this study, anger/hostility was not found to be associated with depression.

The NEO Neuroticism factor (meaning the overall neurotic personality traits) was found to be significantly associated with depression whereby students who scored high or very high for the total score of NEO Neuroticism factor have a 3.6 times risk of developing depression as compared to students who scored very low, low or average on that scale. The positive association found between overall Neuroticism and depressive symptoms were in agreement with results from previous studies[25-27].

In conclusion, after controlling for socio-demographics, and coping styles, this study clearly indicates that overall neurotic personality traits and in particular the depression facet of neuroticism is significantly associated with depression amongst first year medical and dental students in USM. An interesting finding in this study was that dental students were significantly more depressed than medical students. A possible reason was that dental students had additional academic burden when compared to medical students. Otherwise, there were no significant differences between their socio-demographic variables.

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