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Relationship Among Depression, Self-efficacy, and Quality of Life Among Students in Medical and Allied Health Sciences

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ABSTRACT

Introduction: This study examined a cognitive model of depression among undergraduate students of medical and allied health sciences. Methods: Participants ($N = 279$) completed a series of questionnaires related to depression (Beck Depression Inventory-Malay), negative cognitions (Automatic Thoughts Questionnaire-Malay), dysfunctional attitude (Dysfunctional Attitude Scale-Malay), stressful life events (Life Events Survey), self-efficacy (General Self-Efficacy) and quality of life (WHO Quality of Life- BREF). **Results:** Results of descriptive analysis revealed a higher percentage of severe depression among males when compared to female students. Results of structural equation modeling indicated an adequate fit of the model ($\chi^2 = 21.29$, df = 15, $p > .13$; GFI = 0.97; CFI = 0.97; RMSEA = .04). **Conclusion:** The findings also indicated the potential roles of self-efficacy in mediating depression. The results are discussed in terms of self-regulating strategies of managing depression and the roles that university authorities may play in helping students to regulate depression.

Keywords: Depression, students, structural equation modelling, quality of life

INTRODUCTION

Depression is the most common psychiatric disorder reported among university students.[1] Evidence exists suggesting that it is especially high among medical and nursing students.[2,3] For instance, Wolf *et al*.[4] reported that depression and anxiety among medical students were highest in their first year and lowest in their fourth year of study. Similarly, Stewart *et al*.[3] suggested that the rates of depression and anxiety are highest among first year students. Knowledge of this prevalence is especially important given the fact that students' mental health status in their early years of study is the best predictor of their psychological well-being during the later years of their study.[3]

Prevalence of depression among students in Malaysia is comparable to that of western studies.[5] For instance, Sherina *et al*.[5] observed high percentages (41.9%) of medical students experiencing symptoms of psychological stress significantly associated with depression such as constant strain, unhappiness and depressed mood, difficulty concentrating, inability to enjoy normal activities, lack of self-confidence, inability to overcome difficulties, incapability of making decisions, and holding perceptions of self as worthless. Given that these symptoms are indication of depression which may potentially impact their general well-being and their academic performance, understanding of the prevalence of depression among this group of students is worthy of further investigation.

Cognitive Model of Depression

Depression has been commonly examined from Beck's cognitive model of depression.[6] This model postulates that cognitive vulnerability to depression is triggered by dysfunctional schemata and is particularly activated upon encountering negative life events. This is followed by the appearance of specific negative cognitions (automatic thought) that take the form of orderly negative beliefs about oneself, one's world, and one's future. This in turn would lead to an increase in the depressive symptoms. Based on Beck's cognitive model of depression, Oei and colleagues[7,8] proposed a causal relationship between stressful life events, dysfunctional attitude, negative cognition, and finally depressive symptoms. Specifically, Oei and colleagues[8] proposed that the frequency of negative cognition is determined by the interaction between negative life events and dysfunctional attitude, which in turn would affect individuals' depressive symptomatologies. More specifically, the model posits the causal relationships between these four variables as follows: (a) negative life event as a precipitating factor, (b) dysfunctional attitude as a moderating factor, (c) negative automatic thought as a cognitive mediator, (d) depressive symptoms as the consequences. This model has been tested in a number of studies and support for its causal relationship has been reported.[9]

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Depression, Self Efficacy, and Quality of life

A growing number of studies have suggested that depression could negatively affect individuals quality of life.[10,11,12] Gore-Felton[10] for instance suggests that quality of life is the most important predictor of depression among patients with a major depressive disorder. Similarly, MacAlinden and Oei[11,8] reported a negative relationship between quality of life and the presence as well as the severity of psychopathology, including depression.[11] Importantly, several researchers have implicated that intervention strategies that focus on self-efficacy may mediate the effect of depression on quality of life.[13,14,15]

Self-efficacy refers to the belief in one's capabilities to organize and execute the courses of action required to produce given attainments. A strong sense of self-efficacy helps individuals dealing with challenging situation without feeling overwhelmed and confused. It tends to help the individual to facilitate goal setting, effort investment, persistence in face of barriers, recovery from setbacks, and emotional adaptiveness.[16] The effects of self-efficacy on quality of life has been investigated in several studies of health related behaviors.[17,18] In this regard, it has been found that self-efficacy and quality of life are positively related[19,18] while depression and self-efficacy are negatively related.[20,15] Additionally, several studies using correlation or structural equation model found that self-efficacy plays a role as mediator to quality of life.[13,15] Importantly, interventions that are tailored to increase self-efficacy may improve quality of life and reduce depression.[21,22,18]

In summary, the prevalence of depression among students of medical and nursing studies is alarming. Depression studies among university students have primarily focus on medical and nursing students. We view that understanding the issue of depression among other allied health sciences students are also important given the fact that depression may negatively influence their well being and academic performance as well. Although the benefits of self-efficacy have been investigated from a number of perspectives, to our knowledge, no studies have been conducted to examine the interrelationship between cognitive model of depression, self-efficacy and quality of life among medical and allied health science students, particularly in Malaysia. Hence, the present study was undertaken with the objective of investigating the interrelationship between integrated cognitive model of depression, self-efficacy and quality of life among undergraduate students in Malaysia.

METHODS

Participants

The sample consisted of 279 undergraduate students of medical and allied health sciences. Eighty one percent of the total participants were female and 19% percents were male. Their age ranged from 18 to 28 years, with a mean of 20.57. All participants are undergraduate students who attend either medical or allied health science (nursing, dietetic, radiotherapy, biomedicine, and forensic science) in one of the public universities in Malaysia. Percentages of students by year levels were 48%, 17%, 12%, 12% and 9% for first, second, third, fourth and final year, respectively.

Instrumentations

Beck Depression Inventory-Malay.[23] The BDI-Malay is a validated version of the original BDI[24] with 20 items that provide an indication of the level of depressed mood. Participants respond to questions in relation to how they felt over the past week, with higher scores indicating more severe depression. The BDI-Malay does not constitute a clinical diagnosis, but has been widely used as a tool in the assessment process, and for discerning changes in mood during treatment. The full scale is considered to have adequate psychometric properties. Full descriptions of the validity and reliability of this measure is reported elsewhere.[25]

Automatic Thoughts Questionnaire-Malay.[25] ATQ-Malay is a 17-item questionnaire measuring the frequency of negative automatic thoughts. Respondents rate the frequency of the 17 negative thoughts on a 1 to 5 scale. Specifically, participants were asked how frequent negative automatic thoughts such as "I'm a loser" have occurred in the past week. Higher scores indicate increased severity of negative thoughts. Internal consistency of this measure ranges from 0.83 to 0.93. Further descriptions of its psychometric properties are reported in Oei and Mukhtar.[25]

Dysfunctional Attitude Scale-Malay (DAS-Malay; Mukhtar, 2007).[26] DAS-Malay is a 19-item measure of the presence of more permanent dysfunctional attitudes to life, which predispose an individual to depression.[27] The measure was based on the original DAS[28] with responses attached to a 7-points Likert scale ranging from "totally agree" to "totally disagree". Full descriptions of the psychometric properties of this measure are reported elsewhere.

Life Experience Survey (LES).[29] The LES assesses the impact of stressful life events on the individuals. In the present study, the total negative score of each subject was used as the index for negative life stress. Sarason *et al*.[29] have demonstrated a test-retest reliability, over a 5-6 week interval, of .56 (p<.001) to .88 (p<.001) for the negative change score. In addition, this test is relatively free of social desirability biases and is capable of differentiating college students who have sought help for adjustment problems from those who have not.[29]

WHO Quality of Life-BREF-Malay (WHOQOL-BREF Malay).[30] The WHOQOL-BREF Malay is a 26-item measure of quality of life. In the present study, a total score of the four domains of health (physical, psychological, social, and environment) was used to indicate individuals' overall quality of life. Hasanah *et al*.[30] reported good discriminant validity, construct validity, internal consistency (0.64 to 0.80) and test-retest reliability (0.49 to 0.88) of the measure.

General Self-Efficacy (GSE).[31] GSE is a measure of general sense of perceived self-efficacy with the aim in mind to predict coping with daily hassles as well as adaptation after experiencing all kinds of stressful life events. The scale is attached to a 4-point scale. Evaluation of this measure in a sample of 23 nations revealed strong findings of its psychometric properties. Detailed descriptions of the validity and reliability of this measure are reported by Schwarzer.[31]

Procedure and Statistical Analyses

Prior to data collection, permission to conduct the study was obtained from relevant authorities. Participation in the study was voluntary. All of the data for this study were collected through group administrators. Each participant was provided with a battery of questionnaires as described above, with a standardized instruction on how to complete the questionnaires. Signed informed consent was obtained from all participants prior to their participation.

Two statistical procedures were utilized. Descriptive statistics were used for data screening and data descriptions while structural equation modeling was performed to examine the interrelationship between the measured variables. SEM model fit was evaluated using multiple fit indices. The selected indices were the chi-square statistic (χ^2), the goodness-of-fit index (GFI),[32] the comparative fit index (CFI),[33] and the Depression and Students 9 root mean square error of approximation (RMSEA).[34] A good model fit is indicated by values of .90 or higher for the GFI and CFI. For the RMSEA, values of .05 or lower indicate close fit while values less than .08 indicate acceptable fit.[34]

RESULTS

A full sample descriptive statistics are presented in Table 1. Using cut-off points proposed by Beck[24] for no-mild depression (0-9), mild-moderate (10-18), and moderate-severe (19-29) depression, and severe depression (30-63) symptoms, our data suggests that symptoms of depression in the present sample were mild to moderate in terms of severity.

Table 1. Full Sample descriptive statistics

	N	Min	Max	Mean	Std Deviation	Skewness	Kurtosis
Age	279	18	28	20.57	2.45	.76	.29
BDI	279	.00	35.00	12.67	6.72	.60	.19
ATQ	279	17.00	62.00	30.40	8.87	.98	.84
DAS	279	21.00	98.00	56.46	12.52	.17	.38
QOL	279	40.00	89.00	62.77	8.56	.31	.09
GSE	279	57	153	104.09	17.98	.09	-.25

Std. error of Skewness = 1.5
Std. Error of Kurtosis = .29

Specifically, we found 14%, 45%, and 41% of the participants were in moderate-severe, mild-moderate, and no-mild categories of depression. In terms of gender, male participants experience higher percentage of severe depression when compared to female.

Table 2. Percentages of depression by genders

		no-mild	mild-moderate	moderate-severe
Gender	Male	38.5%(20)	44.2%(23)	17.3%(9)
	Female	41.4%(94)	45.4%(103)	13.2%(30)

The model testing was conducted in the following sequence: (1) moderating effect of dysfunctional attitude, (2) mediation effect of general self-efficacy (3) a combined model of moderating and mediating variables.

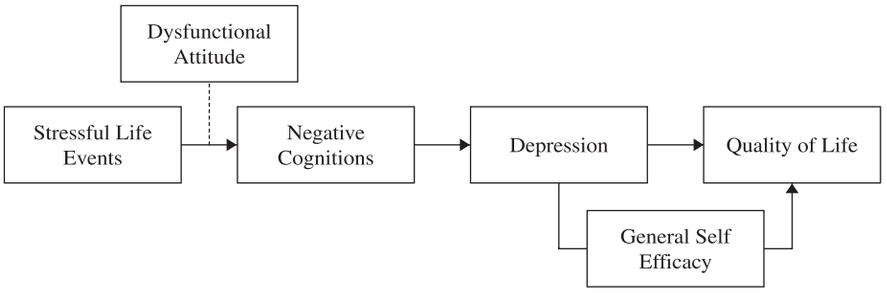

Figure 1. Hypothesized Relationships between Integrated Cognitive Model of Depression, Self-Efficacy and Quality of Life

On testing the moderation effect, a multigroup analysis within Amos 6.0 was used to assess the moderating variable effects on the structural model.[35] The analysis was conducted in a two-step approach. Firstly, the appropriate structural parameters are constrained to be equal across groups, thus generating an estimated covariance matrix for each group and an overall χ^2 value. The parameter equality constraints were then removed, resulting in a second χ^2 value with fewer degrees of freedom. The moderator effects are tested by assessing whether statistical differences exist between the two χ^2 values. If the change in the χ^2 value is statistically significant, the null hypothesis of parameter invariance is rejected and a moderator effect is indicated.[18] The results of the path analysis revealed a nonsignificant chi-square difference between high and low dysfunctional attitude score ($\tilde{a}\chi^2 = 1.024$; df = 2; p = .60) indicating that dysfunctional attitude did not moderate the effect of stressful life event on negative cognitions.

It was also hypothesized that general self-efficacy would mediate the effect of depression on quality of life. In testing this hypothesis, a series of regression analysis was first conducted to ensure that it satisfies the predictor-outcome relationships.[37,38] Specifically, mediational hypothesis requires (a) a significant association between predictor and the criterion, (b) a significant association between predictor and the mediator, (c) a significant association between the mediator and the criterion. The results of regression analysis satisfied the requirements for BDI – QOL ($\beta = -.570$, p = .000), BDI – GSE ($\beta = -1.113$, p = .000) and GSE – QOL ($\beta = .214$, p = .000), respectively.

Given the result from of moderating effect analyses, the moderator variable was constrained to be equal in the final analysis. Using AMOS 6, the results indicate a close fit of the model ($\chi^2 = 21.29$, df = 15, $p > .13$; GFI = 0.97; CFI = 0.97; RMSEA = .04) with all of unstandardized regression weights were significant. Detailed descriptions of individual path loadings are presented in Table 3.

Table 3. Detailed Descriptions of Path Loadings of the Hypothesized Model of Integrated Cognitive Model of Depression, Self-Efficacy and Quality of Life

Model Paths			URW	p	SRW
Stressful life events	→	Negative Cognition	2.11	<.01	.18
Negative Cognition	→	Depression	.432	<.001	.54
Depression	→	Quality of Life	-.035	<.001	-.23
Depression	→	Self-efficacy	-.05	<.001	-.29
Self-efficacy	→	Quality of Life	.263	<.001	.28

URW = Unstandardized Regression Weights
SRW = Standardized Regression Weights

DISCUSSION

Medical and allied health related training has long been associated with numerous stressors that may affect student psychological health and subsequently their quality of life[39]. These stressors, both student-specific as well as common everyday life stressor must be dealt with in order to minimize the incidence of chronic stress among the students. Indeed, concerns over students overall quality of life in not unfounded given the fact that it is directly related to their general well being but also their academic performance. Our study is important in terms of providing a model for intervention framework. Specifically, we postulate the need to focus on dysfunctional attitude and self-efficacy in self-regulating intervention strategies.

The results of the present study however only partially support this notion. Specifically, we found support for the mediating effects of self-efficacy on quality of life. In other words, the negative effects of depression on quality of life are significantly reduced due to the effects of self-efficacy. This finding parallels to the study conducted by Maciejewski, Prigerson, and Mazure,[40] who found that self-efficacy significantly predict quality of life. Furthermore, Maciejewski and colleagues also found negative relationship between self-efficacy and depression and positive relationship between self-efficacy and quality of life. Consistent with Maciejewski *et al*.[40] we also found similar relationship between these variables in the present study.

This finding may have potentially important implication for school authorities. Firstly, we echoed recommendation highlighted by Roberts and colleagues[41] to equip students with self-regulating strategies of managing stress and depression. In this regard, educational intervention such as stress management training may be introduced into their curriculum. In fact, it has been shown that educational intervention may promote positive attitude towards personal health care, including mental and psychological health. Secondly, peer-monitoring strategies may also be used to control the prevalence of depression among the students. Specifically, students should be encouraged to report to school authorities their compromised colleagues. In this regard, a venue for information, support and early intervention to assist ill students as well as students confronting with compromised colleagues should be created and well publicized. Awareness of the negative consequences for remaining silent benefits of reporting such illnesses should also be instilled among the students.

More importantly, we are in view of the need for close attention to intervention strategies that emphasize on self-efficacy among the students. As quality of life may include several domains such as physical, psychological, spiritual and environmental, intervention strategies focusing on each of these domains may be beneficial in enhancing individual's general well-being.

Our model also postulates the need moderating effects on negative cognitions. The finding from this study however did not support this contention. More specifically, we found that stressful life-events affect negative emotion regardless of the levels of dysfunctional attitude in the individuals. This finding, however, is parallel to several western studies [7, 8] that suggest dysfunctional attitude may remain rigid and resistant to change even after patients undergo rigorous therapy. This may even be more difficult for non-Western population to discuss their deep level of cognitive function (i.e. dysfunctional schema) in particular among healthy population. Echoing our prior recommendation, we view that enhancing student efficacy to deal with these stressful life event may reduced negative cognition and thus the severity of depression symptom.

LIMITATIONS AND CONCLUSIONS

Valuable though these findings have been, there are several inherent limitations in this study. Firstly, the data was collected using self-report measures, thus, recall errors and social desirability bias may be present. Although specific steps were undertaken to minimize this limitation, the findings should be interpreted within this limitation. Secondly, although efforts have been made to use valid and reliable instrument, this is not always possible. Specifically, we utilized translated version of the instruments and our analysis lend support for the psychometric properties of this measures. Although the measures we utilized have been previously validated, they have not been subjected to rigorous psychometric assessments. Thus, may reduce the credibility of the measure. We are in view that the model should be further investigated once a more rigorously tested measures become available. Thirdly, the data was collected from a mentally healthy sample. Although the data point out a fraction of severe level of depression symptoms in the sample, the findings may have been different if the model is investigated among mentally ill patients. To conclude, future studies may be carried out to further investigate the hypothesized model with the limitation being addressed.

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