ORIGINAL ARTICLE

Structural Relationship of Psychiatric Disorders, Quality of Life, Coping Styles and Their Associated Factors Among Brain Pathology Patients and Hematological Cancer Patients

*Priscilla Das[1,7], Nyi Nyi Naing[2], Nadiah Wan-Arfah[3], KON Noorjan[4], Yee Cheng Kueh[5], Kantha Rasalingam[6]

[1] Faculty of Medicine, SEGi University No. 9, Jalan Teknologi, Taman Sains Selangor, Kota Damansara, PJU 5, 47810 Petaling Jaya, Selangor, Malaysia
[2] Faculty of Medicine, Universiti Sultan Zainal Abidin, Medical Campus, Jalan Sultan Mahmud, 20400 Kuala Terengganu, Terengganu, Malaysia
[3] Faculty of Health Sciences, Universiti Sultan Zainal Abidin, Gong Badak Campus, 21300 Kuala Nerus, Terengganu, Malaysia
[4] Department of Psychiatry, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia 43400 UPM Serdang, Selangor
[5] Unit of Biostatistics & Research Methodology, Department of Psychiatry, School of Medical Sciences Universiti Sains Malaysia 16150 Kubang Kerian Kelantan, Malaysia
[6] Department of Neuroscience, Hospital Kuala Lumpur 50586 Jalan PahangKuala Lumpur
[7] Unit of Biostatistics & Research Methodology, School of Medical Sciences Universiti Sains Malaysia 16150 Kubang Kerian Kelantan, Malaysia

ABSTRACT

Introduction: The study aimed to examine the structural relationship of major depressive disorder (MDD), anxiety disorder, various mental diseases, quality of life, coping methods, and other variables in patient with brain pathology and hematological cancer patients. **Methods:** A total of (n=215) samples were included in the structural equation modeling (SEM) analyses. The analyses were done with brain pathology patients (110) and haematological cancer patients (105). **Results:** In the current study, the multivariate normality kurtosis was 9.112 with c.r = 3.950 obtained in this SEM model. In the SEM model, the global health status towards MDD can explain about 30% of the variance. The global health status score was found to have a significant positive association with self-distraction coping styles, gender, and emotional functioning. Gender has a significant positive association with global health status, indicating that male patients have improved overall health. In terms of severity of MDD the positive correlation was found with panic disorder life time. Emotional functioning, self distraction and global health status were shown to have a significant and inverse relationship with the severity of MDD (p<0.05). **Conclusion:** The severity of MDD was found to have a strong and detrimental association with cancer types indicating the brain pathology patients tends to have more severity of depression compared to haematological cancer patients.
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Corresponding Author:
Priscilla Das,
Email: daspriscilla@gmail.com
Tel: +60102070314

INTRODUCTION

Malaysia has a robust healthcare system and is an upper-middle-income country, yet its cancer survival rates are still lower than other upper middle-income countries. This can be the result of problems including low cancer screening rates, poor cancer awareness, delays in cancer detection and diagnosis, and delays in getting medical care. Using advanced structural equation modelling, we have investigated the interrelationships between quality of life, coping methods, social support, clinical determinants, and demographic influence on depression and anxiety among the brain tumor patients and hematological cancer patients.

It is more likely that patients to suffer from psychological problems such as depression, anxiety, decreased quality of life, and poor coping mechanisms that associates with brain pathology and hematological cancer patients. Therefore particular consideration in psychotherapy and care should be implemented together with brain pathology treatment to increase

their quality of life as well as their coping techniques in order to overcome their overall mental illness health problems. Implementing both psychotherapy and medication could improve brain disorder patients' quality of life and coping styles and improve their psychiatric disorder. This will help to reduce the cost of therapy for brain disorders in oncology.

Through this study, a better understanding on the fundamental role of depression and anxiety in these brain pathology patients would provide opportunity to intervene early and thus saving cost and enhance the overall prognosis of individuals with brain pathology.

MATERIALS AND METHODS

The research was performed in the Kuala Lumpur Hospital (HKL), a referral hospital for neurological cases in Malaysia. Brain pathology patients (n=110) were gathered between April 2016 to December 2016. A total of 105 patients from Hospital Ampang who were diagnosed with haematological malignancy based on radiological findings with non-Hodgkin lymphoma, acute myelogenous Leukemia, acute lymphoblastic leukemia , Hodgkin lymphoma, other lymphoma , other leukemia and multiple myeloma. The respondents were recruited during the year of 2010 to 2011. The data was used for SEM analysis.

Questionnaires
The following questionnaires were used: MINI International Neuropsychiatric Interview, Patient Health Questionnaire, European Organization for Research and Treatment of Cancer Quality of Life and Brief Cope questionnaires were used in the study.

Statistical tests and data analysis
The structural equation modelling (SEM) method was used to investigate the connections between quality of life, coping methods, MDD, and anxiety in brain pathology patients.

Data analysis was conducted using the Statistical Package for Social Sciences programme version 22.0 and AMOS version 24.0 were used. The p <0.05 was set for statistical significance. Several fit indices were used to assess the SEM model's goodness of fit. The statistics included chi-squared statistics with a desired value of p<0.05, the root mean square error of approximation (RMSEA) with a desired value of less than 0.07, the Tucker and Lewis index (TLI) and comparative fit index (CFI) with desired values of greater than 0.95, and the Tucker and Lewis index (TLI) with a desired value of less than 0.95.(1, 2).

Conditions for inclusion
Three key inclusion criteria were used to choose the participants. The members must first be diagnosed with a psychiatric disorders. The research involved patients of all levels of neurological conditions and haematological cancer patients who had a high degree of consciousness. Second, the study's participants should be capable of communicating in Malay, English, Mandarin, or Tamil. Finally, the participant must be receptive and interviewable.

Criteria for exclusion
First, if a patient wants to withdraw from the study, they will be taken out of the research. Second, if people with neurological disabilities were excluded from the research. Third, participants who were in distress and unable to answer were omitted from the study.

Ethical approval
Ethical clearance was obtained from the Human Research Ethics Committee at Universiti Sains Malaysia (FWA Reg No: 00007718; IRB Reg. No: 00004494) (USM/JEPeM/16050178) and the Ministry of Health's Medical Research & Ethics Committee (NMRR-16-1134-29874) (IIR). The Ethical Committees of the Ministry of Health and the Faculty of Medicine and Health Sciences, University Putra Malaysia, approved the study.

RESULTS

Socio-demographic characteristics of haematological cancer patients
The research was carried out at the Hospital Kuala Lumpur Malaysia (HKL) and Hospital Ampang. The study comprised of 110 individuals who were diagnosed with brain pathology by radiological appearance with later histological confirmation based on WHO grade in Hospital Kuala Lumpur. The participants' average age was 42.5 years (95% CI= 39.6, 45.4). During the research period, 105 patients were contacted in haematological wards in Hospital Ampang. The study received a 100% response rate. The participants' average age was 40.4 years (95% CI= 37.4, 43.5).
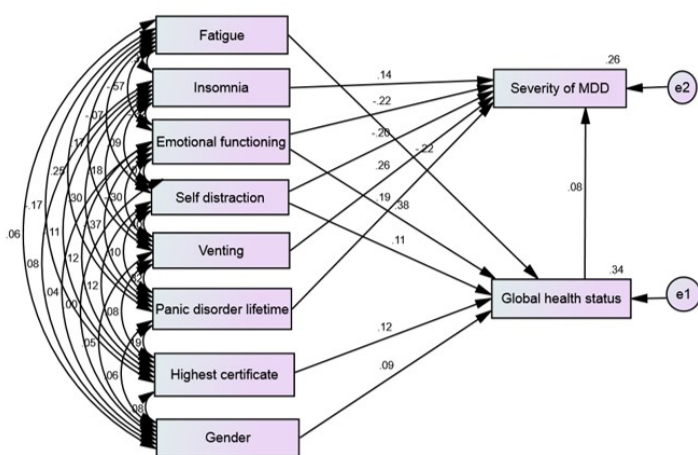
Structural equation modeling (path analysis)
Brain pathology patients
The studies were conducted on patients with brain pathology. The SEM analysis included a total of 110 samples (n=110). The Chi-square normalised by degrees of freedom χ^2/df should not be greater than 3, the comparative fit index (CFI) should be greater than 0.95, and the root mean squared error (RMSEA) should not be greater than 0.06. In the analysis, the p-value should not be significant. The multivariate normality kurtosis in the current investigation was 7.996 with c.r = 2.707 in this SEM model. The statistics comprised chi-squared statistics, and with a required value of p>0.05, the study achieved Chi-square=6.226 with probability level=0.398. In this model, the root mean square error of approximation (RMSEA) was 0.019 with a target value of less than 0.07, the Tucker and Lewis index (TLI) = 0.990, and
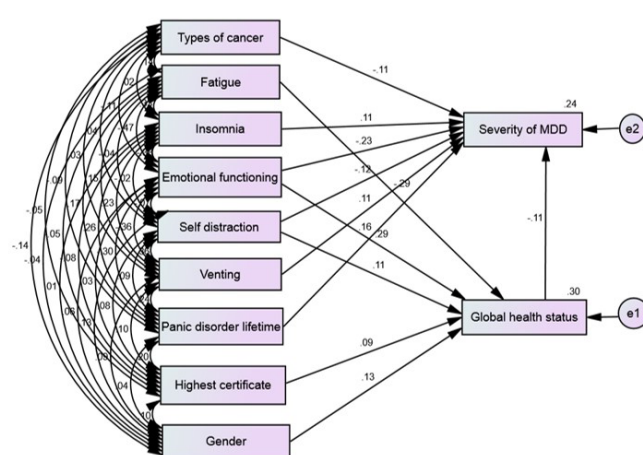
Table 1 : Regression Weights

		Estimate	Std.esti-mate	S.E.	C.R.	P (two-tailed)	P (one-tailed)
Global health status Score	← Self distrac-tion	1.148	.106	.853	1.346	.178	0.089
Global health status Score	← **Fatigue**	**-.155**	**-.222**	**.067**	**-2.308**	**.021**	**0.011**
Global health status Score	← Gender	4.303	.093	3.607	1.193	.233	0.117
Global health status Score	← Highest certif-icate	1.437	.120	.951	1.511	.131	0.066
Global health status Score	← **Emotional functioning**	**.297**	**.378**	**.075**	**3.964**	******	******
Severity of MDD	← Insomnia	.005	.139	.003	1.559	.119	0.060
Severity of MDD	← **Emotional functioning**	**-.011**	**-.221**	**.005**	**-2.091**	**.036**	**0.018**
Severity of MDD	← **Self distrac-tion**	**-.132**	**-.198**	**.060**	**-2.175**	**.030**	**0.015**
Severity of MDD	← **Venting**	**.176**	**.259**	**.065**	**2.690**	**.007**	**0.0035**
Severity of MDD	← **Panic disor-der lifetime**	**.796**	**.186**	**.397**	**2.006**	**.045**	**0.023**
Severity of MDD	← Global health status Score	.005	.083	.006	.848	.396	0.198

Figure 1 : Structural Equation Modeling: Depression, Anxiety, Quality of Life and Coping Styles among Brain Pathology Patients (n=110).

Figure 2a : Structural Equation Modeling: Depression, Anxiety, Quality of Life and Coping Styles among Brain & Hematological Cancer Patients (n=215).

the comparative fit index (CFI) =0.999 with a desirable value of better than 0.95.

Figure 1 shows the individual pathways. Six of the eleven pathways were significant with p-values less than 0.05 (one-tailed) and R2 values ranging from 0.26 to 0.34, indicating that the variance explained varied from 34% for global health status to 26% for depression severity. An R2 = 0.34 in Fig. 1 indicates

that global health status towards MDD can explain about 34% of the variance. The fatigue and emotional functioning were shown to have a strong positive and negative connection respectively with global health status score (p < 0.05). In terms of severity of MDD the positive relationship was found with panic disorder life time (p=0.023). Emotional functioning and self-distraction were shown to have a significant and inverse connection with MDD severity (p0.05).

Venting coping methods were shown to have a substantial and favourable connection with the severity of MDD (p<0.05). (Table I).

### Brain pathology patients and haematological cancer patients

The analyses were done further with brain pathology patients and haematological cancer patients. A total of (n=215) samples were included in the SEM analyses (Table II). In this SEM model, the multivariate normality kurtosis was 9.112 with c.r = 3.950. The statistics included chi-squared statistics, and with a required value of p>0.05, the study achieved Chi-square=4.158 with probability level=0.305. In this model, the root mean square error of approximation (RMSEA) was 0.001 with a target value of less than 0.07, the Tucker and Lewis index (TLI) = 1.072, and the comparative fit index (CFI) =1.000 with a desired value of better than 0.95.

Figures 2a and 2b highlight the relevance of the individual pathways. Nine of the twelve routes were statistically significant with p-values less than 0.05 one-tailed and R2 values ranging from 0.24 to 0.30, indicating that the variance explained varied from 30% for global health status to 24% for depression severity. Table II presents the results of the multiple regression analysis using SEM techniques. In examining the relationships between global health status towards severity of MDD is negatively related at p < 0.05. An R2 = 0.30 indicates that global health status towards MDD can explain about 30% of the variance. The self distraction coping styles, gender, emotional functioning were found to have a significant positive relationship with global health status score (p < 0.05). The gender have significicant positive relationship with global health status indicates that the male patients tends to have better global health status compared to female patients. The negative relationship exist between fatigue and global health status score p<0.001. In terms of severity of MDD the positive relationship was found with panic disorder life time (p=0.007). Types of cancer, emotional functioning, self distraction and global health status were found to have significant and negative relationship with severity of MDD (p<0.05). The types of cancer significantly have negative relationship with severity of MDD which means the brain pathology patients tends to have more severity of depression compared to haematological cancer patients.

Table II : Regression Weights

		Estimate	Std.estimate	S.E.	C.R.	P (two-tailed)	P (one-tailed)
Global health status Score	**Self distraction**	**1.272**	**.111**	**.670**	**1.899**	.058	**0.029**
Global health status Score	**Fatigue**	**-.214**	**-.287**	**.048**	**-4.413**	<0.001	**<0.001**
Global health status Score	**Gender**	**5.908**	**.129**	**2.655**	**2.225**	.026	**0.013**
Global health status Score	Highest certificate	1.126	.087	.747	1.508	.132	0.066
Global health status Score	**Emotional functioning**	**.227**	**.292**	**.051**	**4.483**	<0.001	**<0.001**
Severity of MDD	**Types of cancer**	**-.265**	**-.106**	**.152**	**-1.746**	.081	**0.0405**
Severity of MDD	Insomnia	.004	.108	.002	1.634	.102	0.051
Severity of MDD	**Emotional functioning**	**-.010**	**-.226**	**.003**	**-3.010**	.003	**0.0015**
Severity of MDD	**Self distraction**	**-.080**	**-.125**	**.042**	**-1.915**	.056	**0.028**
Severity of MDD	**Venting**	.071	.113	.044	1.617	.106	0.053
Severity of MDD	**Panic disorder lifetime**	**.719**	**.159**	**.292**	**2.463**	.014	**0.007**
Severity of MDD	**Global health status Score**	**-.006**	**-.111**	**.004**	**-1.653**	.098	**0.049**
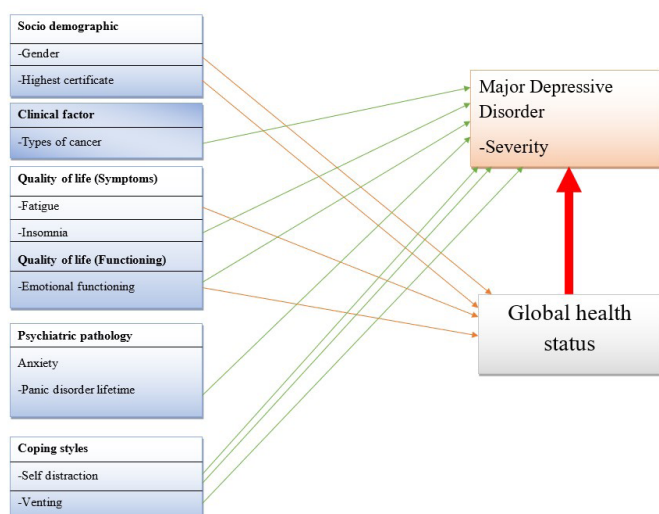
Figure 2b : Structural Equation Modeling: Depression, Anxiety, Quality of Life and Coping Styles among Brain & Haematological Cancer Patients (n=215).

DISCUSSION

The global health status to MDD explained about 30% of the variation in the SEM model. Self-distraction coping styles, gender, and emotional functioning were all shown to have a substantial positive relationship with the global health status ranking. These findings are consistent with past research that have discovered that depression is connected with lower physical health (3-5), role (4), cognitive (4, 5), emotional (3-5), social functioning (3-5), and global health status (4, 5). In terms of symptoms, the MDD was associated with fatigue, nausea/vomiting, sleeplessness, appetite loss, diarrhoea, financial troubles, dyspnoea, and constipation. Fatigue is one of the symptoms (5), sleep disturbance (3) appetite loss (3) financial difficulties (3) and nausea (5) were also linked to depression among cancer patients. Patients described vomiting symptoms as unpleasant when they happened (7). Other symptoms, such as constipation, were found to be predictors of depression in people with terminal cancer. (3). The seriousness of MDD was observed to have a strong and detrimental association with emotional functioning, self-distraction, and global health status.

The incidence of MDD was shown to have a favorable association with the duration of panic disorder which is a form of anxiety. Anxiety is also linked to social functioning in cancer patients (4, 5). Dyspnea is also a predictor of anxiety in cancer patients (3). A prior research of cancer patients discovered an inverse relationship between quality of life score and depression and anxiety (6). Poor cognitive functioning and dyspnea were found to be predictive of anxiety in cancer patients (5).

Interestingly in the current study also shown that gender has a significant positive relationship with global health status, suggesting that male patients have better overall health than female patients. The incidence of MDD has been shown to have relationship with cancer types, suggesting that patients with brain pathology are more likely to have more severity of MDD.

CONCLUSION

The global health status score was found to have a significant positive association with self-distraction coping styles, gender, and emotional functioning. Gender has a significant positive association with global health status, indicating that male patients have improved overall health. In terms of severity of MDD the positive relationship was found with panic disorder life time . The severity of MDD was shown to have a substantial and unfavourable association with emotional functioning, self distraction, and global health status (p<0.05). The severity of MDD was found to have a strong and detrimental association with cancer types indicating the brain pathology patients tends to have more severity of depression compared to haematological cancer patients.

The primary mechanisms that explain the intensity of depression include psychiatric disorders, quality of life, and coping methods. These factors can be the mediators between clinical factors and diagnosis for depression.

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