

Mental health in patients with hematological malignancy in different phases of their disease and during the phase of hematopoietic stem cell transplantation. A longitudinal study

Chen Wen-Xiang
Hualien Tzu Chi Medical Center, Taiwan.
AHN, RN, MSN
wenxiang0805@gmail.com

Introduction

- Hematopoietic stem cell transplantation (HSCT) is a demanding treatment for hematologic malignancies.
- The toxic preparative regimen most patients receive (high-dose chemotherapy, sometimes with total body irradiation) suppresses or destroys their immune function, necessitating protective isolation and causing side effects including fatigue, cognitive difficulties, and sexual dysfunction.
- HSCT has also been associated with depression, anxiety, fear of cancer recurrence.

Literature Review

- Resilience is an individual's ability to maintain physical and emotional well-being in the face of adversity.
- Although theories conflict about how (or when) to objectively measure it, they consistently suggest that individual resilience enables patients to harness the resources needed to maintain well-being during and after cancer therapy, to move beyond their experience with hope and insight, and to better adapt to future adversity.

Literature Review

- More than 40 000 haematopoietic stem cell transplants are performed worldwide each year, with tens of thousands of HSCT survivors.
- Low patient-reported resilience also has been associated with higher risks of anxiety and depression among hospitalized cancer patients, and with psychological distress, poor quality of life, and risky health behaviors among the cancer patients.
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purpose

- For health care services to be well equipped to provide support to those experiencing significant distress, robust estimates of the prevalence of psychological outcomes are needed. Understanding the risk factors associated with high levels of psychological distress will also allow services to provide relevant and timely support to those who need it most.
- Resilience has been shown to be a causal mechanism in a wide range of mental health, a measurable trait that predicts resilience status, which is strongly associated with psychological variables during the 4 stages of patients.

Methods-Design

- This longitudinal and descriptive study was designed to estimate the changes of demographic characteristics, personal characteristics, psychological distress, hope, spiritual and resilience at 4 different measurement time points: after bone marrow biopsy (T1); initial disease diagnosis (T2); accepted chemotherapy (T3); and hematopoietic stem cell transplantation (T4).

Methods-Analysis

- Descriptive statistics were used to describe demographic characteristics and other major variables.
- The comparisons of demographic variables with categorical data between groups were analyzed by Chi-square.
- The relationships among depression, anxiety, hope, spiritual and resilience were determined by Pearson correlation.
- Multiple regression analyses were conducted to identify the predictors of overall resilience.

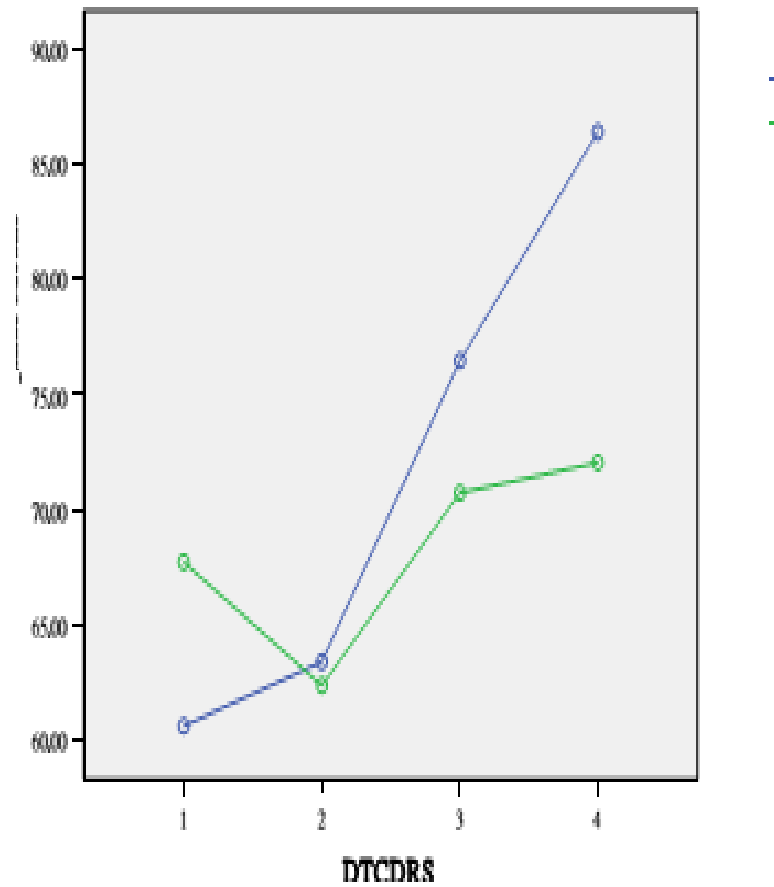
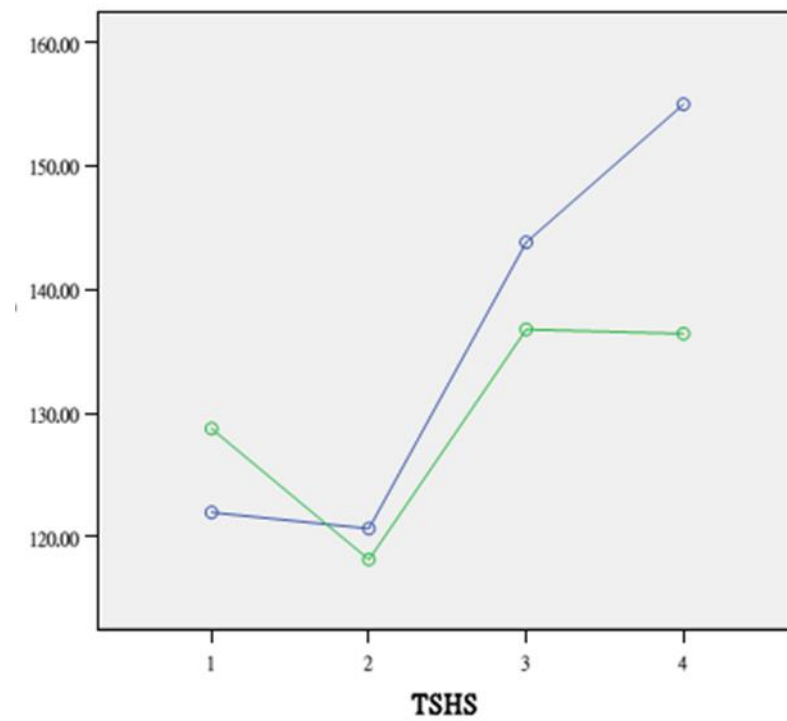
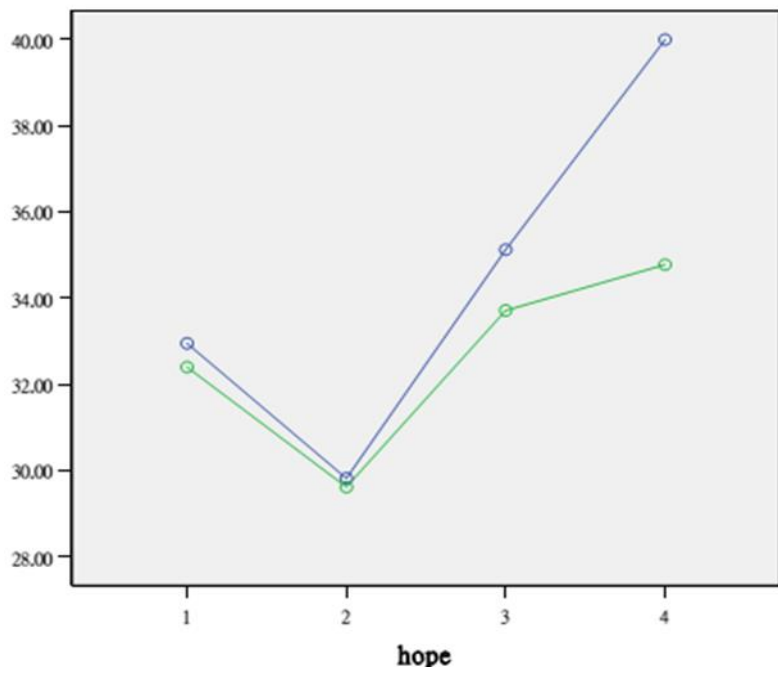
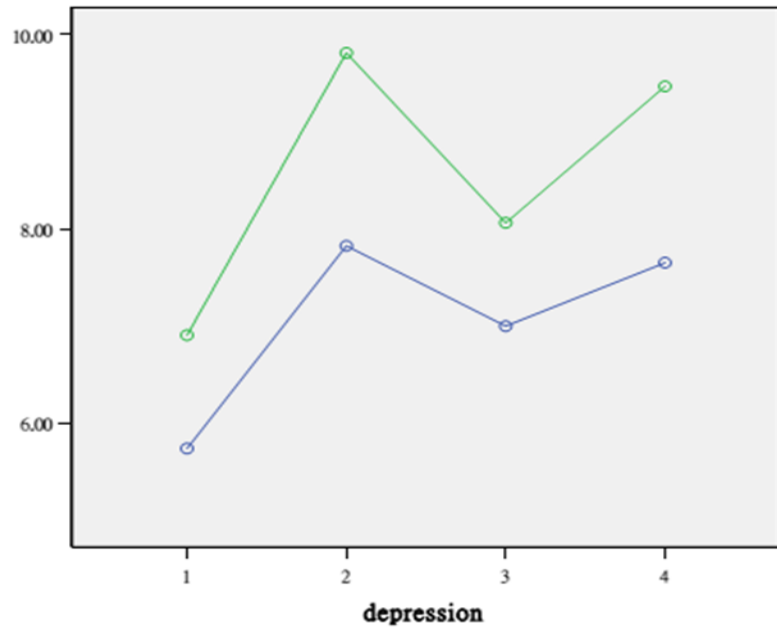
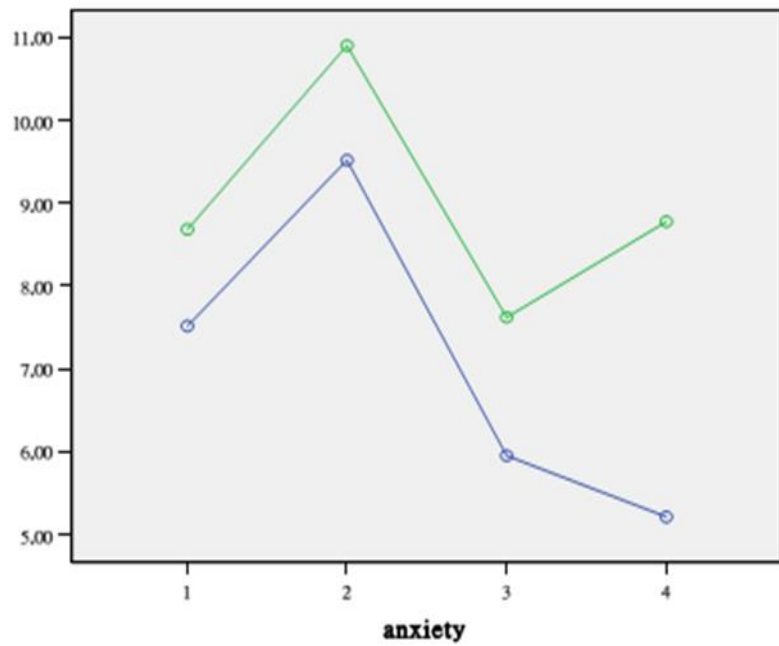
Methods-Analysis

- A repeated-measures analysis of variance (RM ANOVA) then examined differences on the major variables between the autologous and allogeneic HSCT groups during the course of the study.
- Multiple regression analyses were conducted to identify the predictors of overall resilience with resilience at one particular measurement time as dependent variables, and mental status as independent variables.

Results

Table 1. The changes of mental status variables over time

Variables	Autologous (n=23)						Allogeneic (n=37)					
	T1 M(SD)	T2 M(SD)	T3 M(SD)	T4 M(SD)	F	Post Comparisons	T1 M(SD)	T2 M(SD)	T3 M(SD)	T4 M(SD)	F	Post Comparisons
Anxiety (0-21)	7.5(5.1)	9.5(5.0)	5.9(5.3)	5.9(4.5)	4.50**	T2>T3,T4 T3<T2 T4<T2	8.6(5.4)	10(6.1)	7.6(4.1)	8.7(4.3)	3.68*	T1<T2 T2>T1,T3 T3<T2
Depression (0-21)	5.7(5.4)	7.8(4.7)	7.0(4.8)	7.6(4.1)	1.26		6.9(5.0)	9.8(6.1)	.8.0(4.3)	.9.4(5.0)	3.61*	T1<T2,T4 T2>T1 T4>T1,
Hope (0-48)	32(12)	29(12)	35(10)	40(9.3)	4.27**	T1<T4 T2<T4 T4>T1,T2	32(11)	29(12)	33(9.0)	34(8.1)	3.26*	T1>T2 T2<T1,T3,T4 T3>T2 T4>T2
Spiritual (0-188)	122(51)	120(49)	143(34)	155(31)	7.06***	T1<T3,T4 T2<T3,T4 T3>T1,T2 T4>T1,T2	128(38)	118(46)	136(30)	136(29)	3.99*	T1>T2 T2<T1,T3,T4 T3>T2 T4>T2
Resilience (0-100)	60(25)	63(25)	76(20)	86(15)	21.2***	T1<T3,T4 T2<T3,T4 T3>T1,T2 T4>T1,T2	67(20)	62(25)	70(16)	72(16)	2.69	



Results

Table 2. The changes of mental status variables and resilience over time

Variables	Resilience (CDRS)							
	autologous (n=23)				allogeneic (n=37)			
	T1	T2	T3	T4	T1	T2	T3	T4
T1								
Anxiety	-0.448*				-0.558**			
Depression	-0.529**				-0.605**			
Hope	0.838**				0.741**			
Spiritual	0.904**				0.843**			
T2								
Anxiety		-0.548**				-0.708**		
Depression		-0.656**				-0.666**		
Hope		0.883**				0.845**		
Spiritual		0.921**				0.941**		
T3								
Anxiety			-0.486*				-0.523**	
Depression			-0.802**				-0.278	
Hope			0.431*				0.804**	
Spiritual			0.851**				0.884**	
T4								
Anxiety				-0.507*				-0.584*
Depression				-0.753**				-0.445*
Hope				0.879**				0.815**
Spiritual				0.893**				0.872**

Results

Table 3. Regression model of resilience over time for autologous (HSCT)

Variables	Predictors	B	Beta	t	p	R ²	Adjusted R ²	F
T1								
Resilience	Anxiety	-1.460	-0.295	-1.558	0.137	0.857	0.826	17.785***
	Depression	1.706	0.367	1.747	0.098			
	Hope	0.536	0.257	1.207	0.243			
	Spiritual	0.368	0.779	4.217	0.001			
T2								
Resilience	Anxiety	0.604	0.119	0.835	0.415	0.859	0.827	7.375*
	Depression	-0.119	-0.022	-0.144	0.887			
	Hope	0.642	0.318	1.034	0.315			
	Spiritual	0.357	0.683	2.716	0.014			
T3								
Resilience	Anxiety	0.179	0.046	0.269	0.791	0.780	0.731	6.837*
	Depression	-1.796	-0.417	-1.706	0.105			
	Hope	0.091	-0.048	0.373	0.714			
	Spiritual	0.315	0.526	2.615	0.018			
T4								
Resilience	Anxiety	-0.016	-0.005	-0.034	0.973	0.819	0.778	2.469
	Depression	-0.596	-0.162	-0.864	0.399			
	Hope	0.440	0.266	0.821	0.423			
	Spiritual	0.251	0.516	1.575	0.134			

Results

Table 4. Regression model of resilience over time for allogeneic (HSCT)

Variables	Predictors	B	Beta	t	p	R ²	Adjusted R ²	F
T1								
Resilience	Anxiety	-0.523	-0.138	-0.582	0.556	0.718	0.676	14.176***
	Depression	-0.030	0.007	-0.036	0.971			
	Hope	-0.304	0.174	-0.562	0.578			
	Spiritual	0.487	0.907	3.765	0.001			
T2								
Resilience	Anxiety	-1.104	-0.262	-1.817	0.080	0.902	0.887	50.732***
	Depression	1.100	0.262	1.976	0.058			
	Hope	-0.312	-0.147	-0.886	0.383			
	Spiritual	0.956	1.077	7.123	0.000			
T3								
Resilience	Anxiety	-0.950	-0.242	-1.983	0.058	0.812	0.784	15.050***
	Depression	0.667	0.182	1.494	0.147			
	Hope	-0.090	-0.051	-0.199	0.844			
	Spiritual	0.468	0.879	3.879	0.001			
T4								
Resilience	Anxiety	-1.775	-0.454	-2.041	0.051	0.811	0.783	17.959***
	Depression	1.752	0.521	2.564	0.017			
	Hope	0.129	0.062	0.313	0.757			
	Spiritual	0.471	0.834	4.238	0.000			

Discussion

- Total resilience changed significantly over time in both autologous and allogeneic groups with the highest scores at T4.
- All the regression models of resilience at T1, T2 and T3 were statistically significant in both groups, and the predictive power ranged from 70% to 80%.
- Thus, the results from this study could reassure prospective HSCT recipients in that this particular treatment compares favorably to other treatments when mental status side effects are considered. Indeed, the overall pattern of measures of mental status indicate that there is improvement over time

Study Limitations

- The findings are limited by the bias inherent in a purposive sample, which resulted in a narrow are range.
- Further, more ethnically diverse samples would lend greater generalizability to the findings. Recruitment bias needs to be considered any long-term outcome studies.

Conclusions

- Traditional oncology treatment strategies focus primarily on physical aspects of patient care and are not well suited to address survivors' subjective experiences and psychosocial needs related to economic stressors.
- Future studies would benefit from a larger sample of HSCT patients than the present study. For instance, a larger sample could provide adequate power to undertake comparisons between autologous and allogeneic transplant recipients who generally receive different preparative regimens and experience different post-transplant side effects and complications.

Thanks