

# The Quality of Life and Survival in Patients with Terminal Cancer

Yi-Horng Lai<sup>1</sup>

## Abstract

**Background:** Hospice care neither prolongs life nor hastens death. It is designed to provide comfort and support to patients and their families when a life-limiting illness no longer responds to cure-oriented treatments. **Objectives:** The purposes of this study were to investigate the quality of life and survival analysis of terminal cancer patients. Purposive sampling was used for the terminal cancer patients in oncology and palliative care units in a medical center in Taiwan. **Material and Methods:** The instrument used in the study was McGill Quality of Life Questionnaire (MQOL) which had a good psychometric test. The methodology of data analysis in this study was survival analysis. Survival analysis is a branch of statistics which deals with death in biological organisms and failure in mechanical systems. **Results:** Based on the result, mortality rate of hospice patients is 3.55 times of non-hospice patients. One more unit of Existential Wellbeing of non-hospice patients, and the risk of death increase 1.15 times; one more unit of Existential Wellbeing of hospice patients, and the risk of death increase 4.10 times. One more unit of Social Support of non-hospice patients, and the risk of death increase 0.84 times; one more unit of Social Support of hospice patients, and the risk of death increase 2.98 times.

**Keywords:** Life quality, Terminal cancer, Hospice and palliative care, Survival analysis

## 1 Introduction

Most cancer patients should face the stage of terminal cancer and to bear the pain of body and soul, and resulting in poor quality of life of patients and their families. After going through suffering, pain and died.

The philosophy of palliative care is embedded in holistic care that encompasses the concepts of physical, social, psychological and spiritual care, with the aim of preventing

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<sup>1</sup>Department of Health Care Administration, Oriental Institute of Technology, Taiwan.

and relieving suffering and improving quality of life for patients with life-threatening illness and their families [1]. Patients who have received hospice services experience a better quality of life during their terminal stage. Bretscher, Rummans, Sloan, Kaur, Bartlett, and Borkenhagen [2] showed that hospice patients' quality of life was relatively high and stable over time with appropriate palliative services. Li, Zhang, Fu, Zhao, Li, and Li, [3] investigated the influence of hospice care on the quality of life and psychological state of elderly inpatients nearing death. Before and after a minimum of 1 month of hospice care, all the indexes including quality of life, appetite, spirit, and sleep quality were higher than the control patients that received conventional nursing services.

Hospice care neither prolongs life nor hastens death. It is designed to provide comfort and support to patients and their families when a life-limiting illness no longer responds to cure-oriented treatments. A few researches focus on the comparison of survival time between patients of hospice and conventional care. Keyser, Reed, Lowery, Sundborg, Winter, Ward, and Leath [4] conducted a retrospective review evaluation and suggest no detrimental impact on survival for hospice patients. In this study, median time receiving hospice care was 1 week for non-hospice patients versus 8 weeks hospice patients, and median overall survival for non-hospice patients was 9 months versus 17 months for hospice patients. Tang, Chen, Huang, Koong, Lin, and Hsiao [5] conducted a retrospective cohort study to examine the durations of patient survival after enrollment and the result showed that the mean duration of survival is 67.21, 44.76, 36.28, and 26.21 days for both home care and inpatient care, home care only, hospice care, and inpatient hospice care only, respectively. Connor, Pyenson, Fitch, Spence, and Iwasaki [7] compared the difference of survival periods of terminally ill patients between those using hospices and not using hospices, and found that the mean survival was 29 days longer for hospice patients than for non-hospice patients.

The purposes of this study were to investigate the quality of life and survival analysis of terminal cancer patients. Purposive sampling was used for the terminal cancer patients in oncology and palliative care units in a medical center in Taiwan.

## **2 Materials and Methods**

### **2.1 Research Framework**

The main research question of this study was the relationship between the quality of life and survival rate. The quality of life included physical symptoms, psychological symptom, existential wellbeing, and social support.

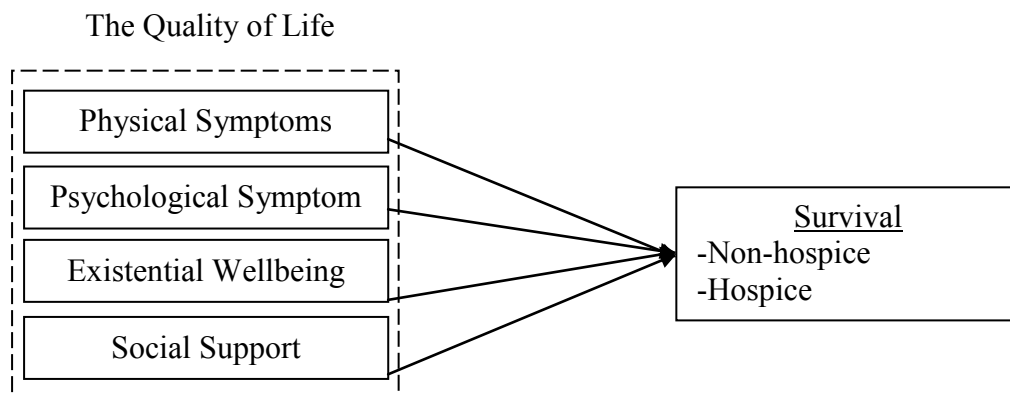


Figure 1: Research framework

## 2.2 Research Data

The research data in this study was collect by the structured questionnaire in a medical center in Taipei City, Taiwan. The rules of selecting object of study were:

1. The cancer patients were confirmed for curative treatments have been no response, and stop the cancer cure medical by physician.
2. The age of patients was more than 18-year-old.
3. Patients with clear awareness, communication, and is willing to accept the interviewers
4. Patients can be terminated at any time during enrolled time.

The data in this study was obtained from the Survey Research Data Archive (Taiwan). These data was collected by Weyu Hu for the research: The study of quality of life and quality adjusted survival in patients with advanced cancer. The research period was from August, 1, 2001 to July, 31, 2002.

## 2.3 Research Tools and the Reliability

There are four parts in the questionnaire in this study. It included physical symptoms, psychological symptom, existential wellbeing, and social support. The reliability of these four parts of the questionnaire was as Table 1.

Table 1: Reliability statistics

Factor	N	Cronbach's $\alpha$
Physical Symptoms (PHY)	4	.80
Psychological Symptom (PSY)	4	.73
Existential Wellbeing (EXI)	4	.74
Social Support (SOC)	4	.75

## 2.4 Methodology of Data Analysis

The methodology of data analysis in this study was survival analysis. Survival analysis is a branch of statistics which deals with death in biological organisms and failure in mechanical systems. The data analysis in the study was done with Stata 12.1 and IBM SPSS Statistics 20.

### 3 Results

#### 3.1 Descriptive Statistics

There are 102 samples include 40 non-hospice patients, 62 hospices patients in this study. The survival status is shown as Table 2.

Table 2: Case processing summary

	Total N	N of Events	Censored	
			N	Percent
Non-hospice	40	27	13	32.50%
Hospice	62	57	5	8.10%
Overall	102	84	18	17.60%

Units: Months

According to Table 3, the average survival time of non-hospice patients is 16.318 months, the mortality rate of non-hospice patients were more than 50% after 10.933 months. The average survival time of hospice patients is 4.362 months, the mortality rate of hospice patients were more than 50% after 2.667 months.

Table 3: Means and medians for survival time

	Mean		Median	
	Estimate	Std. Error	Estimate	Std. Error
Non-hospice	16.32	2.20	10.93	3.26
Hospice	4.36	.69	2.67	.21
Overall	9.03	1.13	4.00	.73

Units: Months

#### 3.2 Data Analysis

Based on overall modeling test, Chi-square was 39.537 (P-value<0.05) and Cox Regression was significant. The value of Likelihood Ratio test was 40.174 (P-value<0.05), and it means the regression model was significant.

Based on the summary of the regression model, it could be found that Existential Wellbeing (EXI) and Social Support (SOC) were significant. The regression model of this study could be shown as follow:

$$h(t)=h_0(t)\exp(1.27\times HOS+0.14\times EXI-0.18\times SOC) \quad (1)$$

Table 4: Summary of cox regression model

	B	SE	Wald	df	Sig.	Exp(B)
Hospices (HOS)	1.27	.28	20.51	1	<.01	3.55
Physical Symptoms (PHY)	-.09	.05	2.77	1	.10	.92
Psychological Symptom (PSY)	-.03	.06	.27	1	.60	.97
Existential Wellbeing (EXI)	.14	.07	3.86	1	.04	1.15
Social Support (SOC)	-.18	.08	5.17	1	.02	.84

Base on the regression model, mortality rate of hospice patients is 3.55 ( $e^{1.27}$ ) times of non-hospice patients. One more unit of Existential Wellbeing of non-hospice patients, and the risk of death increase 1.15 times ( $e^{0.14}$ ); one more unit of Existential Wellbeing of hospice patients, and the risk of death increase 4.10 times ( $e^{1.27+0.14}$ ). One more unit of Social Support of non-hospice patients, and the risk of death increase 0.84 times ( $e^{-0.18}$ ); one more unit of Social Support of hospice patients, and the risk of death increase 2.98 times ( $e^{1.27-0.18}$ ).

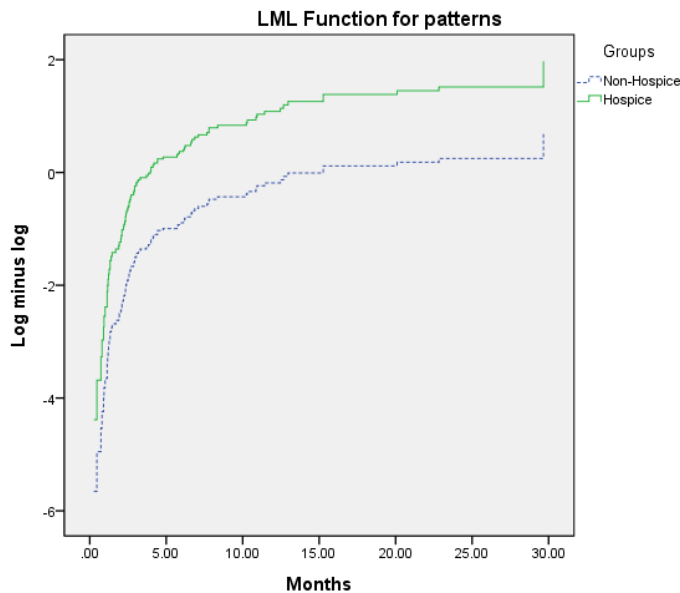


Figure 2: Plot of LML function

The curve of  $\text{Log}(-\log(t))$  of Hazard function of non-hospice patients and hospice patients were as Figure 2, and both curve of two groups were two parallel lines. The ratio of the two function line was a constant, and it means the model of this study was followed the assumption of Cox regression model rule. According to Figure 3, the up one was the Hazard function of the hospice patients and the down one was the Hazard function of the non-hospice patients. It could be found that the mortality rate of non-hospice patients was higher than the mortality rate of hospice patients.

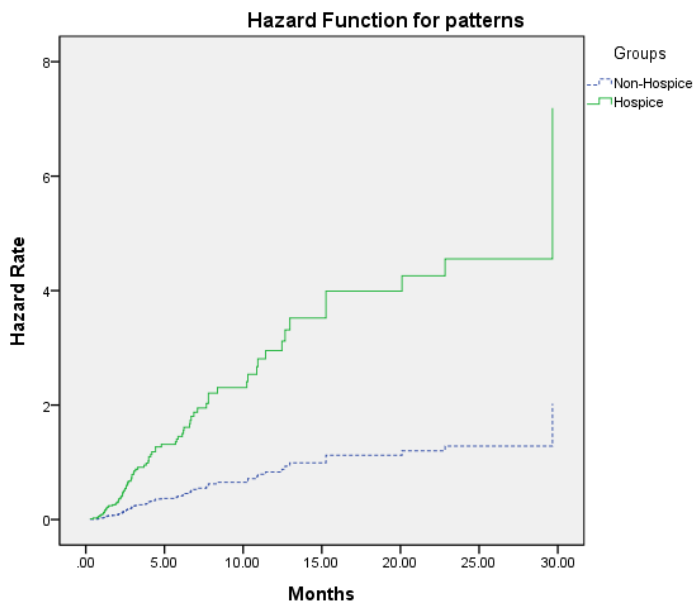


Figure 3: Plot of hazard function

## 4 Conclusion

Based on the result, survival rate of non-hospice patients is higher than hospice patients. Kang, Lin, Hwang, Lin, Chang, and Hwang [7] investigated the impact of hospice care on end-of-life elderly patients with lung cancer in Taiwan and founded that compared with the control group the hospice-care group had a significantly shorter hospital stay and lower costs of hospitalization, and had an elevated incidence of co-morbid diabetes mellitus, higher scores on the Charlson Comorbidity Index, fewer acute lower respiratory conditions, and fewer invasive procedures. Chang, Liu, Chao, Lin, Chen, Chen, and Chiou [8] conducted an evaluation of a new hospice consulting system in Taiwan, and found that the home care patients had better performance status, less shortness of breath, less limbs swelling, less flatulency and less constipation. And the follow-up showed that the symptoms/signs were significantly improved after intervention of consulting team in pain, shortness of breath, difficulty in sleeping, nausea, constipation, changes in skin and adoption.

Social Support is positive with survival rate, and one more unit of Social Support of non-hospice patients, and the risk of death increase 0.838 times; one more unit of Social Support of hospice patients, and the risk of death increase 2.977 times in this study. Holdsworth and King indicated that the patients expressed that they had held stereotyped views of hospice care as being 'the end' and that this fear was initially a barrier to receiving hospice support [9]. Candy, Holman, Leurent, Davis, and Jones conducted a systematic review and found that hospice care at home reduced general health care use and increased family and patient satisfaction with care for quantitative studies [10], and revealed that home hospice services support families to sustain patient care at home and hospice day care services generate for the patient a renewed sense of meaning and purpose in the qualitative literature.

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