RESEARCH ARTICLE

Factors Related to Treatment Refusal in Taiwanese Cancer Patients

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Abstract

Background: Incidence and mortality rates for cancer have increased dramatically in the recent 30 years in Taiwan. However, not all patients receive treatment. Treatment refusal might impair patient survival and life quality. In order to improve this situation, we proposed this study to evaluate factors that are related to refusal of treatment in cancer patients via a cancer case manager system. Materials and Methods: This study analysed data from a case management system during the period from 2010 to 2012 at a medical center in Northern Taiwan. We enrolled a total of 14,974 patients who were diagnosed with cancer. Using the PRECEDE Model as a framework, we conducted logistic regression analysis to identify independent variables that are significantly associated with refusal of therapy in cancer patients. A multivariate logistic regression model was also applied to estimate adjusted the odds ratios (ORs) with 95% confidence intervals (95%CI). Results: A total of 253 patients (1.69%) refused treatment. The multivariate logistic regression result showed that the high risk factors for refusal of treatment in cancer patient included: concerns about adverse effects (p<0.001), poor performance(p<0.001), changes in medical condition (p<0.001), timing of case manager contact (p=.026), the methods by which case manager contact patients (p<0.001) and the frequency that case managers contact patients (≥10times) (p=0.016). Conclusions: Cancer patients who refuse treatment have poor survival. The present study provides evidence of factors that are related to refusal of therapy and might be helpful for further application and improvement of cancer care.

Keywords: Refusal of cancer treatment - PRECEDE model - case manager - Taiwan

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Introduction

The Ministry of Health and Welfare of Taiwan (2013) revealed that cancer holds the first place among the 10 leading causes of death, and its incidence has been continuously increasing during the last 20 years. With the advancements in medical treatment, patients receiving cancer therapy can have better survival rates. The cancer case manager system has been introduced into the national cancer treatment system to enhance the quality of cancer treatment (Lin and Li, 2013). Cancer patients can receive care under the case management model after receiving their diagnosis; however, a proportion of patients refuse treatment, causing a decrease in their survival rates (Helena, 2005).

Mohamed et al. (2012) pointed out that during the process of medical treatment, the possible factors i nfluencing treatment refusal by patients include concerns about adverse effects, underlying illnesses, a poor support system, financial situation, transport difficulty, use of alternative medicine, and other factors. In addition, patients might also refuse treatment because of inadequate channels of communication with the medical team, resulting in their lack of awareness about their medical conditions and treatments. The attitude of the doctors and the content of their explanations about the medical condition are usually the key factors helping patients decide on whether they will receive treatment. Budkaew and Chumworathayi (2013) discovered that adequate medical knowledge and a good attitude, an understanding of the thoughts and concerns of the patients, and timely clarification of doubts by the doctors help increase patients' willingness to receive treatment.

As cancer patients undergo multidisciplinary treatments or examinations, they have to visit various specialized departments and examination rooms while being unfamiliar with the treatment characteristics of those different departments. During the treatment process, cancer case managers are able to integrate resources from different departments and provide total care throughout the treatment. In addition, as coordinators and spokespersons, they communicate and coordinate with the medical

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team to help solve the problems of the patients and their families (Wang, 2010). Case managers are also able to provide advice on disease care and psychological support in their role as educators, as well as to remediate and manage abnormal indicators on the basis of the systematic management of patient data (Yan et al., 2009), thereby encouraging health-promoting behaviors among patients.

Refusal of cancer treatment might result in rapid disease deterioration, emergence of physical symptoms, and metastasis. During the terminal stages of cancer, there might also be a sense of uncertainty toward the disease, fear of death, and sense of hopelessness among patients (Harvey, 2006). Therefore, it is worth discussing which factors affect treatment refusal by cancer patients.

The studies by Tramm et al. (2011), which retrospectively identified health behaviors that increased survival rate in breast cancer patients, and that of Hislop et al. (2007), which investigated the knowledge of Chinese immigrants to Columbia on hepatitis B, both employed the PRECEDE model as an evaluation tool. Their results revealed that the PRECEDE model was a satisfactory tool for the evaluation of health behaviors. The PRECEDE model consists of the following: *i)* predisposing factors, *ii)* reinforcing factors, and *iii)* enabling factors that can influence and change the behaviors of patients (Lin et al., 2012). Therefore, the PRECEDE model was used in this study to investigate the factors related to the prevention of behavioral changes leading to treatment refusal during the course of disease, for the purpose of providing a reference for the prevention of treatment refusal during the provision of clinical care to cancer patients.

Materials and Methods

Secondary data analysis was performed on patient data obtained from the Hospital Information System database of a certain hospital in northern Taiwan. The patients were evaluated and found to have the top 10 cancers (lung cancer, hepatocellular carcinoma, colorectal cancer, breast cancer, oral cancer, gastric cancer, prostate cancer, pancreatic cancer, esophageal cancer, and cervical cancer) between 2010 and 2012, and had also received care from case managers. The sample size was 18,478, of which 2809 patients with suspected cancer were excluded and 695 patients were excluded because of having multiple cancers. The total number of valid subjects was 14,974. The study was approved by the institutional review board (serial no. 103-2804C) for data analysis.

Data collection was conducted by using the variables of the PRECEDE model, as follows: *i)* predisposing factors, including basic patient information; *ii)* reinforcing factors, including concerns about adverse effects, patients' quality of life scale (ECOG [Eastern Cooperative Oncology Group] score), changes in medical condition, and alternative therapies; *iii)* enabling factors, including transportation difficulty, financial limitations, trust in the care quality of other hospitals, unsatisfactory medical services, lack of awareness about the medical condition, and poor family support; and *iv)* factors related to the case manager, including the timing, method, and frequency of patient contact with the case manager.

By combining the above-mentioned factors with the "case manager factors," the authors have developed a research framework for this study to investigate the factors influencing treatment refusal in cancer patients, as shown in Figure 1.

Data analysis

SPSS Statistics for Windows, version 17.0, was used for data analysis. Descriptive statistical analyses were performed to characterize the basic properties of the study subjects. Relevant univariate analyses were performed by using chi-square tests to analyze the correlations among factors. Significant factors identified by means of univariate analysis were set as independent variables, and such factors were controlled to perform multinomial logistic regression analysis.

Results

Data from the case management system between 2010 and 2012 were used for analysis. A total of 14,974 patients with one of the top 10 cancers were included, among whom 253 patients refused treatment. The study subjects were assigned to either the treatment refusal group or the treatment receipt group, according to four categories of factors: predisposing factors, enabling factors, reinforcing factors, and health behaviors. The results of the univariate analyses are shown in Table 1.

The results indicated that the predisposing factors influencing treatment refusal with significant differences between the two groups included the following: age >70 years ($p<0.05$), unemployment ($p<0.001$), having a high education ($p<0.001$), being widowed ($p<0.001$), and an unspecified cancer stage ($p<0.001$); there was no significant difference in sex and religion ($p<0.005$) (see Table 1).

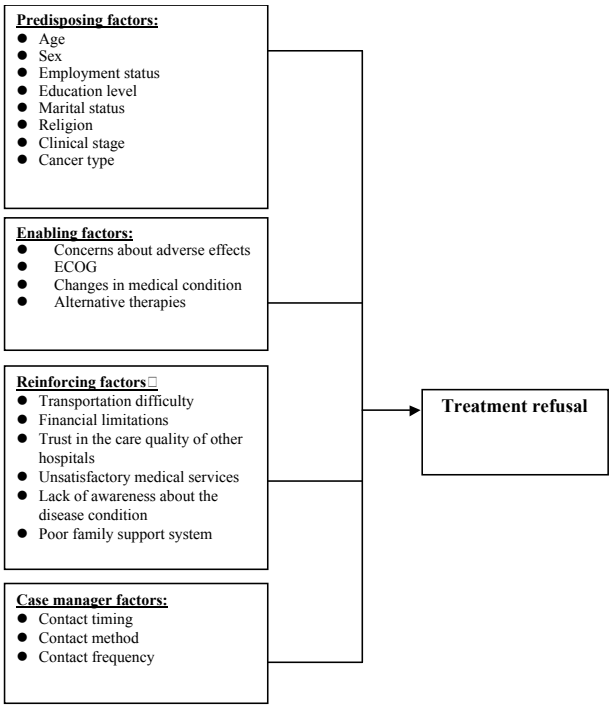

Figure 1. Research Framework

Table 1. *General characteristics (N=14,974)

Variables	Received treatment (n=14,721)		Refused treatment (n=253)		*p*-value
	n	%	n	%	
Predisposing factors					
Age, years					
<40	941	6.4%	9	3.6%	
41–50	2,432	16.5%	32	12.6%	0.400
51–60	3,872	26.3%	40	15.8%	0.835
61–70	3,268	22.2%	44	17.4%	0.352
71–80	2,950	20.0%	72	28.5%	0.008
>80	1,258	8.5%	56	22.1%	<0.001
Sex					
Female	6,556	44.5%	119	47.3%	
Male	8,165	55.5%	134	52.7%	0.428
Employment status		98.3%			
Yes	6,799	58.1%	43	34.1%	
No	4,909	41.9%	83	65.9%	<0.001
Education					
Illiterate	1,136	9.3%	32	24.8%	
Elementary school	4,121	33.8%	50	38.8%	<0.001
Junior and high school	4,650	38.2%	31	24.0%	<0.001
Above college	1,828	15.0%	10	7.8%	<0.001
Marital status					
Married	10,134	82.5%	101	77.7%	
Single	714	5.8%	5	3.8%	0.440
Divorced	521	4.2%	2	1.5%	0.180
Widowed	922	7.5%	22	16.9%	<0.001
Religion					
None	3,914	32.0%	41	31.8%	
Buddhism	3,844	31.4%	39	30.2%	0.887
Taoism	2,084	17.0%	21	16.3%	0.886
Others	2,403	19.6%	28	21.7%	0.666
Stage					
Stage I	2,137	22.4%	19	16.7%	
Stage II	1,866	19.6%	21	18.4%	0.459
Stage III	2,439	25.6%	32	28.1%	0.181
Stage IV	3,000	31.5%	37	32.5%	0.249
Stage unspecified	84	.9%	5	4.4%	<0.001
Enabling factors					
Concerns about adverse effects	156	1.1%	51	22.0%	<0.001
ECOG	342	2.4%	79	34.1%	<0.001
Changes in medical condition	57	0.4%	8	3.4%	<0.001
Alternative therapies	19	0.0%	53	22.8%	<0.001
Reinforcing factors					
Transportation difficulty	949	6.5%	1	0.4%	0.006
Financial limitations	4	0.0%	2	0.9%	<0.001
Trust in the care quality of other hospitals	479	3.3%	1	0.4%	0.040
Unsatisfactory medical services	23	0.0%	0	0.0%	0.998
Poor family support	17	0.1%	4	1.7%	<0.001
Contact timing					
Case enrollment	11,665	86.8%	197	82.4%	0.050
Evaluation	5,479	40.8%	77	32.2%	0.008
Health guidance	6,970	51.9%	75	31.4%	<0.001
Coordination	4,423	32.9%	118	49.4%	<0.001
Contact method					
Outpatient clinic	10,038	74.7%	121	50.6%	<0.001
Telephone interview	7,263	54.0%	204	85.4%	<0.001
Electronic medical record	7,809	58.1%	97	40.6%	<0.001
Contact frequency					
<10 times	12,163	88.9%	229	1.7%	
≥10 times	1,277	9.3%	10	0.1%	0.007

*Because of missing or incomplete data, the total of all variables might not equal to 14,974.

The results of multinomial logistics regression analysis are shown in Table 2. The results for the odds ratio for various adjusted variables revealed the following concerning predisposing factors: patients with concerns about adverse effects were 91.29 times (95%CI, 39.11-213.14) more likely to refuse than receive treatment

Table 2. Multinomial Logistic Regression Analysis of Factors Related to Treatment Refusal (N=14,974)

Variables	OR	95% CI		
		Lower	Upper	p-value
Enabling factors				
Concerns about adverse effects	91.296	39.106	213.138	<.001
ECOG	56.763	26.702	120.665	<0.001
Changes in medical condition	20.336	3.889	106.340	<.001
Case manager				
Contact timing-health guidance	0.435	0.210	0.904	0.026
Contact method-telephone interview	4.546	2.133	9.687	<0.001
Contact frequency-≥10 times	0.209	0.059	0.749	0.016

(p<0.001); patients with poor ECOG score were 56.76 times (95%CI, 26.70-120.67) more likely to refuse than receive treatment; and patients with changes in medical condition were 20.34 times (95%CI, 3.89-106.34) more likely to refuse than receive treatment. Patients receiving health guidance from case managers (p=0.026) were 44% more likely (95%CI, 0.21-0.90) to refuse than receive treatment. Patients receiving telephone interviews (p<0.001) were 4.55 times more likely to refuse than receive treatment (95%CI, 2.13-9.69). When the contact frequency was >10 times (p=0.016), patients were 21% more likely to refuse than receive treatment (95%CI, 0.06-0.75).

Discussion

The results of this study revealed that there were 253 cases of treatment refusal, which means that not all patients received treatment after the cancer diagnosis. The analysis results indicated that patients who were older than 70 years, unemployed, or widowed were more likely to refuse treatment, which is consistent with the finding of Kau, Hu and Chiu (2012). Older patients have less knowledge about their medical conditions; therefore, they tend to have a feeling of uncertainty. Uncertainty about the disease easily leads to depression, which affects patients' compliance to treatment (Juang, 2013). The results of this study are consistent with the findings of Zhang and Dong (2012); that is, elderly and widowed patients have a high tendency toward depression and reduced societal participation, both of which have a negative impact on survival rates.

Further investigations were performed on variables with significant differences, namely concerns about adverse effects, poor ECOG score, and changes in medical condition. Before treatment, health-care professionals perform pretreatment evaluation based on each patient's medical condition and co morbidity factor, including daily physical activity status (ECOG) and changes in medical condition; doctors normally evaluate whether patients are suitable to receive treatment. Mohamed (2012) also mentioned that treatment for patients with poor ECOG and large changes in medical condition might cause worse complications, causing a proportion of such patients to refuse treatment.

In terms of factors related to the case manager, provision of health guidance during contact, using telephone interview as the contact method, and contact frequency ≥10 times showed significant differences. Helena et al. (2005) found that patients might refuse treatment because of concerns about physical discomfort, poor quality of life, or changes in body image caused by the treatment; therefore, they offered suggestions on clinical care, including increased face-to-face or telephone interviews concerning the management of adverse effects, discussions on whether referral to outpatient clinics or relevant specialists is needed to reduce the discomfort caused by adverse effects, as well as providing guidance on how to deal with physical and mental illnesses to improve the quality of life. Similar to the study of Han et al. (2011), 44.66% of patients wished to receive telephone interviews after being discharged or to receive educational booklets on dietary recommendations. This study also found that there was a significant difference among case managers who followed patients through telephone interviews. Clinical case managers who performed follow-ups typically enrolled cases or provided health guidance through face-to-face interviews. However, if the patients failed to attend the follow-up visits or refused treatment, telephone interviews were performed. Similar to the findings of Lin et al (2004), the reasons for patients not attending follow-up visits after telephone interviews included misunderstanding of the disease, referral to another hospital, lack of awareness about the medical condition, or misperception of the health condition. However, as the patients did not attend follow-up visits, the case manager could only conduct telephone interviews with patients who refused treatment. It is speculated that patients might refuse treatment because they were lacking sufficient awareness about the severity of their disease or about the treatment.

Secondary analysis was performed on data obtained from the case management system. However, the database is extremely large and some data may be missing, leading to several limitations to the analysis. For example, the data entry clerk might neglect to fill certain fields, causing incomplete data. In addition, the definitions for data entry fields might vary among health-care professionals and lead to different reasons for treatment refusal; thus, it was impossible to discern the major factors influencing treatment refusal. Therefore, the results of this study cannot be generalized to other hospitals; nevertheless, they can be used as a reference for other hospitals.

It was found in this study that a proportion of patients refuse cancer treatment and that the variables with significant differences included concerns about adverse effects, poor ECOG, changes in medical condition, as well as timing, method, and frequency (>10 times) of

contact with case managers. The involvement of case managers ensures that patients receive more holistic care in a continuous manner throughout the treatment process. Although ECOG and changes in medical condition are physical and disease states that cannot be alleviated by clinic care providers, the concerns about adverse effects might the result of the patients' lack of understanding about their disease and treatment, or their uncertainty concerning post treatment care. Therefore, it is suggested that to eliminate patents' tendency to refuse treatment because of a lack of treatment knowledge, the health-care education initiative should be intensified through the provision of educational materials, regular follow-ups on the adverse effects, involvement of disease survivors, and guidance on adverse-effect management and emergency responses.

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