RESEARCH ARTICLE

Factors Associated with Suicide Risk in Advanced Cancer Patients: A Cross-Sectional Study

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Abstract

The study aimed to find out to what degree suicidal thoughts and associated factors affect the suicide risk of advanced cancer patients. The frequency of suicidal thoughts among patients with cancer, especially in the advanced stages, is about 3 times greater than the adult average in South Korea. We recruited 457 participants with four types of cancers (colon, breast, cervical, and lung) using stratified sampling. Data collection was carried out through one-on-one interviews by trained nurses using a structured questionnaire. Advanced cancer patients with high, vs. low, levels of anxiety and pain had a higher suicide risk. In contrast, having one's spouse as the primary care provider was associated with a low suicide risk. Overall, the three factors of anxiety, pain, and the primary caregiver being one's spouse explained 17.2% of the variance in suicide risk. In conclusion, we derived influencing factors of suicide risk using a sample of patients with various types of advanced cancer. The results provide systematic baseline data for preparing nurse-led interventions to prevent suicidal thoughts and suicide attempts among advanced cancer patients.

Keywords: Advanced cancer- suicide risk- anxiety- depression- pain- performance status

Introduction

Suicide is an internationally important mental health problem that resulted in at least 804,000 deaths worldwide in 2012, with an annual global age-standardized suicide rate of 11.4 per 100,000 head of population (15.0 for males and 8.0 for females) having been reported (World Health Organization, 2014). In South Korea, it is noteworthy that the suicide rate is the highest among Organization for Economic Co-operation and Development countries. In addition, the primary causes of death of South Koreans have been reported to be, in order, cancer, cerebrovascular disease, heart disease, and suicide (Statistics Korea, 2014). The number of people with cancer who have suicidal thoughts (on average, 53.5%) has been found to be about 3 times greater than the adult average in South Korea (Kim et al., 2010; Ryu et al., 2012). Further, the suicide rate among cancer patients, as calculated based on Korea National Statistical Data, was reported to be 2 - 4 times higher than that among the general public (Kim et al., 2010). The rate has been found to be especially high among those who experienced cancer metastasis or were diagnosed with an advanced, incurable cancer (Ahn et al., 2015; Vyssoki et al., 2015).

Patients with advanced cancer include those whose cancer is either metastatic or contained but localized (American Cancer Society, 2014). They experience various symptoms resulting from the cancer itself, the outcome of cancer treatment, or an interaction between the two (Kirkova et al., 2006). Experiencing more types and a greater degree of symptoms reduces patients' ability to carry out tasks in their daily lives (Chang et al., 2000), and is also associated with a negative psychological state, increased likelihood of committing suicide, and reduced quality of life (Tanriverdi et al., 2013).

Accordingly, patients diagnosed with cancer, regardless of the specific type, commonly experience anxiety, depression, and stress (Jadoon et al., 2010; Pinquart and Duberstein, 2010; Traeger et al., 2012). Depression and suicidal thoughts have been reported to be more prevalent among people with cancer than among the general public (Zabora et al., 2001; Costanzo et al., 2007; Kamen, 2010; Maneeton et al., 2012; Zwerenz et al., 2012). Because previous studies found that anxiety and depression are common emotional experiences of advanced cancer patients (Akizuki et al., 2015; Gouveia et al., 2015), the levels of these feature should be continuously observed (Akizuki et al., 2015; Weber et al., 2015). High anxiety and depression reduce people's quality of life (Faller et al., 2015) and can lead to negative outcomes, such as suicidal thoughts and suicide-related behaviors (self-injury, suicide planning, and suicide attempts) (Anderson et al., 2015).

Various aspects are continuously monitored to prevent adverse health consequences and suicide attempts (Ahn et al., 2015; Chehil and Kutcher, 2015), and improve health-related quality of life (Krebber et al., 2012;

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Zwerenz et al., 2012; Chambers et al., 2013) by managing the associated negative psychological state. Screening for and assessing the suicide risk of cancer patients are emphasized as being especially important role among medical professionals (Ahn et al., 2015; Anderson et al., 2015; Chehil and Kutcher, 2015).

The effects of suicide are not limited to the problems of the person involved; rather, they have significant meaning to society as whole. According to a report by the World Health Organization, when one person commits suicide, an average of 5–10 people experience a serious mental shock, which manifests as, for example, feeling guilt and anger, and there is an increased likelihood of imitation suicide. In fact, among the family of the person who committed suicide, the suicide rate increases by up to 4.2 times higher than that of the general public (Kim, 2008; Conwell, 2009). Accordingly, from a social standpoint, it is necessary to manage the pre-suicidal stage, which can predict the occurrence of suicide, and to examine the factors affecting suicidality (Meyer et al., 2010).

However, few previous studies have focused on suicide-related problems and influencing factors among advanced cancer patients. Thoughts about, attempts to complete or risks for suicide could be significant barriers to preparing for a good death and fare welling one's family among advanced cancer patients. Accordingly, the present study attempted to find out what degree of suicide risk advanced cancer patients experience, and to establish which factors affect this risk.

Purpose

The purpose of the present study was to find out which factors affect the suicide risk of advanced cancer patients, with the detailed aims being as follows:

1) Find out what degree of pain, depression, anxiety, performance status, and suicide risk advanced cancer patients experience.

2) Find out if there are correlations among the degree of pain, depression, anxiety, performance status, and suicide risk of advanced cancer patients.

3) Find out which factors affect the suicide risk of advanced cancer patients.

Material and Methods

Study design

The present study used a cross-sectional design to examine the effects of the pain, depression, anxiety, and performance status of advanced cancer patients on their suicide risk.

Participants

Participants were 600 advanced cancer patients visiting one cancer hospital as an outpatient, among whom 150 each had one of four types of cancer (colon, breast, cervical, lung) and were selected using stratified sampling according to the cancer type. One-on-one structured interviews with trained nurses were carried out only with patients who listened to our explanation of the purpose of the study and agreed to participate, and 470 (78.3%) questionnaires were returned. After excluding

13 questionnaires that had missing responses, 457 valid surveys were included in the data analyses.

Instruments
Pain of advanced cancer patients

We developed two questions to evaluate the prevalence and severity of pain of the advanced cancer patients. First, the interviewer asked participants "Did you have any pain during the last week?" If the answer was "yes," participants were then asked to estimate their level of pain on a 5-point scale (from 0 = no pain to 4 = severe pain) by answering the question "How severe was the pain?" A higher score means the participants experienced more severe pain.

Anxiety and depression of advanced cancer patients

The 14-item Hospital Anxiety and Depression Scale developed by Zigmond & Snaith (Zigmond and Snaith, 1983) and tested for reliability and validity by Oh et al.(Oh et al., 1999), was used to assess participants' anxiety and depression. Anxiety was measured with the seven odd numbered items, using a 4-point response scale from 0 (none) to 3 (severe), and a higher score indicates greater anxiety. Specifically, scores of 0–7 signify no anxiety, 8–10 mild anxiety, and 11–21 moderate anxiety. The reliability of the anxiety subscale in the study of Oh et al. (Oh et al., 1999), as measured with Cronbach's α, was .86 and in the present study it was .92.

Depression was measured with the seven even numbered items, using a 4-point response scale from 0 (none) to 3 (severe), and a higher score indicates greater depression. Specifically, scores of 0–7 signify no depression, 8–10 mild depression, and 11–21 moderate depression. The reliability of the depression subscale in the study of Oh et al., (1999), as measured with Cronbach's α, was 0.9 and in the present study it was 0.8.

Performance status of advanced cancer patients

The Eastern Cooperative Oncology Group Performance Scale (ECOG) (Oken et al., 1982) was used to measure participants' performance status. Responses are made on a 5-point scale, where 0 = no symptoms, 1= mild symptoms, 2 = spend 50% or less of the daytime in bed due to symptoms, 3 = spend 50% or more of the daytime in bed due to symptoms, and 4 = spend the entire day in bed, so that a lower score means better performance status.

Suicide risk of advanced cancer patients

Six questions from the suicide risk assessment subscale of the Mini International Neuropsychiatric Interview (Sheehan et al., 1998; Yoo et al., 2006) were used to assess participants' suicide risk, all of which were answered "yes" or "no." Five questions were used to assess death wishes, thoughts of self-injury, thoughts of suicide, suicide planning, and suicide attempts in the past month, and one question assessed lifetime suicide attempt experience. A two-step scoring procedure was used. First, if participants answered "yes" to one or more out of the six questions, they were determined to have suicidality. Next, for participants with suicidality, suicide risk was derived by summing the weighted scores assigned to the

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corresponding question, from 1 to 10.

Data analysis

The collected data were analyzed by using SPSS version 18.0.

1) The general characteristics of participants, their pain, anxiety, depression, performance status, and degree of suicide risk were calculated using descriptive statistics.

2) The differences in suicide risk according to the general characteristics of participants were analyzed using t tests and analysis of variance.

3) Correlations among participants' pain, anxiety, depression, performance status, and suicide risks were analyzed using Pearson's correlation coefficient.

4) To establish which factors affect participants' suicide risk, a multiple regression analysis was performed using a stepwise method to select variables.

Ethical considerations

The present study was carried out after obtaining

Table 1. Participants' Suicide Risk According to Sociodemographic Characteristics and Study Variables

Variables	Category	n	%	M	SD	Suicide risk			(N=457)
						t	F	p	Scheffé
Age (yrs)	<40	45	9.8	4.7	6.2		0.45	0.72	
	40-49	121	26.5	4.1	6.9				
	50-59	181	39.6	3.7	7.0				
	≥60	110	24.1	3.4	7.7				
Sex	Female	341	74.6	4.0	7.1	0.85		0.396	
	Male	116	25.4	3.3	7.1				
Type of cancer	Breast	145	31.7	4.0	7.6		0.16	0.923	
	Uterus	110	24.1	3.8	6.6				
	Intestinal	102	22.3	3.9	7.8				
	Lung	100	21.9	3.4	6.1				
Marital statue	Married	363	79.4	3.4	6.6	2.38	0.019		
	Notmarried	94	20.6	5.6	8.6				
Education	≤Middle school	131	28.7	3.5	7.0	0.21		0.809	
	High school	190	41.6	3.8	7.3				
	≥College	127	27.8	4.1	6.9				
Employment	Yes	78	17.1	4.1	7.3	1.89	0.061		
	No	371	81.2	2.6	6.0				
Religion	Religious	136	29.8	4.6	8.0	1.46	0.146		
	Non-religious	311	68.1	3.5	6.7				
Primary caregiver	Spousea	315	68.9	3.1	6.5		4.8	0.009	a,b<c
	Childrenb	60	13.1	4.5	8.6				
	Othersc	70	15.3	5.7	6.7				
Pain	0a	173	37.9	2.3	4.5		5.73	<.001	a,b,c,d<e
	1b	132	28.9	4.0	7.9				
	2c	89	19.5	4.6	6.9				
	3d	46	10.1	5.6	9.5				
	4e	17	3.7	9.2	11.1				
ECOG	0	78	17.2	2.4	4.6		5.68	0.001	
	1	324	71.4	3.6	7.0				
	2	47	10.4	7.5	9.7				
	3	5	1.1	7.0	11.5				
	4	0	0	-					
Anxiety	0-7(normal)a	299	65.9	2.3	5.4		27.16	<.001	a<b<c
	8-10(mild)b	82	18.1	5.3	7.7				
	11-21(moderate-severe)c	73	16.1	8.5	10.0				
Depression	0-7(normal)a	230	50.7	1.9	4.8		18.76	<.001	a<b,c
	8-10(mild)b	99	21.8	5.4	8.8				
	11-21(moderate-severe)c	125	27.5	6.2	8.2				

M, Mean; SD, standard deviation; p, p-value; ECOG, The Eastern Cooperative Oncology Group Performance Scale

Table 2. Level of Suicide Risk and Subdomain Scores

Variables	Scales/Domains	(N=457) Yes n (%)	M	SD	Min	Max
Suicide risk	Death wish	139 (30.4)	3.8	7.1	0	39
	Thoughts of self-injury	32 (7.0)				
	Thoughts of suicide	113 (24.7)				
	Suicidal plans	20 (4.4)				
	Suicidal attempts in the past one month	9 (2.0)				
	Suicidal attempt experience in the lifetime	58 (12.7)				

Table 3. Factors Influencing the Level of Suicide Risk

Variables (N=457)	B	SE	ß	t	p
(Constant)	1.1	0.7		1.5	0.137
Anxiety	0.5	0.1	0.3	7.4	<.001
Primary caregiver: spouses	-2.0	0.7	-0.1	-3.0	0.003
Pain	0.7	0.3	0.1	2.5	0.012

R^2, 0.172; F, 73.130; p<.001

approval from the institutional review board (NCCNCS-10-375). We used a cross-sectional study design and no influence on or intervention in participants' treatment process was made; no medical harm, right, or welfare was invaded; and ethical guidelines for respecting participants' dignity were complied with.

Results

General characteristics

The distribution of participants' ages was as follows: 181 (39.6%) were aged 50–59 years, 121 (26.5%) were aged 40–49 years, 110 (24.1%) were aged 60 years or over, and 45 (9.8%) were aged under 40 years. There were 341 females (74.5%). The most prevalent cancer type was breast cancer, which was the diagnosis of 145 (31.7%) participants, followed by uterine, intestinal, and lung cancers. There were 363 (79.4%) married participants, and 315 participants (68.9%) had their spouse as the primary caregiver in their family (Table 1).

Regarding pain, more than half of the participants (62.2%) reported experiencing mild to severe pain in the past week. Regarding performance status, 52 (11.5%) were able to take care of themselves but not able to perform any other daily life tasks (≥2 points). A mild to severe degree of anxiety was experienced by 155 (34.2%) participants, and a mild to severe degree of depression was experienced by 125 (49.3%) participants (Table 1).

Level of suicide risk among advanced cancer patients

First, 184 (40.6%) participants answered "yes" to one or more of the six suicidality questions. Next, analysis of the suicide risk among those 184 participants revealed an average response rating of 3.8 points (SD = 7.1). Results of subfactor analysis showed that for subfactor 1, 139 (30.4%) participants answered "yes" to the question "Did you think 'I would rather die' or wish to die during the past month?"; for subfactor 3, 113 (24.7%) participants answered "yes" to the question "Did you want to commit

suicide during the past month?"; and for subfactor 5, nine (2.0%) participants answered "yes" to the question "Did you attempt to commit suicide during the past month?" (Table 2).

Factors influencing the suicide risk of advanced cancer patients

To find out which factors influence the suicide risk of advanced cancer patients, a regression analysis was performed using two items (marital status and primary caregiver) that showed a significant difference in suicide risk among the predictor variables of participants' pain, performance status, anxiety and depression, and general characteristics. Factors with the strongest effect on the suicide risk of advanced cancer patients were, in order, anxiety (ß = 0.3, p < .001), primary caregiver: spouses (ß = -0.1, p = .003), and pain (ß = 0.1, p = 0.012), and these three factors explained 17.2% of the variance in suicide risk (Table 3).

Discussion

The present study evaluated the existence of suicide thoughts and level of suicide risk among patients with advanced cancer, and investigated what level of pain, performance in regard to daily life activities, and psychological state in regard to anxiety and depression affect these factors. Accordingly, attempts were made to predict the factors influencing their suicide risk, which was about 1.5 times higher than that reported a previous study (Maneeton et al., 2012) on general cancer patients. In addition, our participants' suicide risk was found to increase when levels of anxiety and pain were higher. In contrast, having one's spouse as the primary care provider was associated with a lower suicide risk.

First, the present study showed differences in suicide risk according to the psychological aspect of level of anxiety among advanced cancer patients. That is, when the level of anxiety increases from normal (low) to mild, moderate, or higher levels, the risk of suicide also significantly increases. In addition, level of anxiety was an important predictor of the suicide risk of advanced cancer patients. Many previous studies have reported that the emotions of anxiety and depression are common among advanced cancer patients and, in line with this, it was reported that 34% of terminal cancer patients have clinically significant anxiety (Traeger et al., 2012; Lee et al., 2013b; Akizuki et al., 2015; Gouveia et al., 2015), which is similar to the level reported in the present study.

A high level of anxiety among terminal cancer patients was reported to be an especially powerful predictor of reduced spiritual well-being (Lee et al., 2013b), which was demonstrated by the results of regression analysis after adjusting for the participants' age, gender, and level of anxiety. Thus, we can infer that an increase in the anxiety level of terminal cancer patients that reduces their spiritual well-being, which has a protective function during severely stressful situations (Lee et al., 2013b), results in negative outcomes, such as suicidal thoughts and behaviors (self-injury, suicide planning, and suicide attempts).

Although the results of the present study revealed that the suicide risk was significantly higher for patients with advanced cancer who have depression levels that are mild, moderate, or severe, compared to low, depression was not a significant predictive variable for assessing their suicide risk. This differs from previous studies that explored factors influencing suicide-related behavior using different populations, such as cancer patients (Maneeton et al., 2012; Ryu et al., 2012; Vyssoki et al., 2015), seniors living alone (Ko and Kim, 2011), and seniors with dementia (Kim and Hyun, 2013), in which it was reported that depression is a significant predictor of suicide attempts, suicidal thoughts, and suicidality. The results of the present study do, however, align with those of a recent study (Lee et al., 2013a) that reported that the relationship between depression and thoughts of suicide is nonsignificant in patients with cancer in South Korea. To find significant meaning among such diverse results, a systematic investigation involving the consistent use of depression evaluation tools and adjustment for the depression levels of participants should be undertaken.

Second, one predictor variable of suicide risk among advanced cancer patients was pain, especially at severe levels. Such high pain levels is a prominent physical symptom in terminal cancer patients, and it is known to induce threatening stress levels that must be managed through palliative care. Assessment and management of advanced cancer patients is a fundamental role of oncology nurses (Shahriary et al., 2014) and a required competency of all medical professionals in charge of such patients.

Last, having a family member, especially the spouse, as the primary caregiver of the advanced cancer patient was associated with a low risk of suicide. Differences were reported in previous studies (Ko and Kim, 2011; Vyssoki et al., 2015) in regard to negative psychological states (such as depression, anxiety, and stress), quality of life, and suicide-related concepts depending on marital status and the presence of a spouse and/or cohabiting family members (Ko and Kim, 2011; Vyssoki et al., 2015). In the similar context of this study, it can be interpreted that having family members as caregivers could significantly influence the suicide risk of advanced cancer patients.

The limitations of the present study are, first, that data collection was carried out in one institution with participants from one culture. Accordingly, to increase the generalizability and allow the results to be applied to various cultures and institutions, a repeated study is suggested that uses multi-faceted data collection through more inclusive selection of participants, including assessing the characteristics of their diseases. Second, our attempts to source comprehensive data from advanced cancer patients through recruiting participants with different cancer types using stratified sampling meant that the use of diagnostic names, such as breast cancer and uterine cancer, resulted in a gender imbalance. Accordingly, for future studies, comparing gender differences in suicide risk by recruiting a sample with an appropriate gender ratio is suggested. Third, the present study did not investigate the housing situation of the advanced cancer patients, e.g., living with their families or alone. We found a significant difference in suicide risk depending on the participants' marital status and if the primary care provider was a spouse or a member of family, which indicates that the suicide risk of advanced cancer patients could be lower if family members live with them and when there is a support system of family and society. To obtain clear evidence for this proposal, however, there is a need for further studies of advanced cancer patients that take into account whether they live alone or have family members living with them.

The present study made an initial attempt to find out what level of suicide risk that patients with various types of advanced cancer experience, and to derive the factors that influence this risk. We have provided systematic baseline data for preparing interventions to prevent suicidal thoughts and attempts among advanced cancer patients, which will lead to ensuring a good death for this group.

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