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Influencing Variables on Somatization Symptoms in Cancer Patients: Using Core Seven-Emotions Inventory-S*

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ABSTRACT

This study aimed to investigate somatization symptoms perceived by cancer patients, assess core emotions, and examine their relationship with the variables influencing somatization symptoms. The subject of the study was 180 inpatients at a university hospital. The data collection period was from June to August, 2022. The study utilized a measurement tool for somatization symptoms and a Core Seven-Emotions Inventory-S (CSEI-S) based on the concept of 'Chiljeong (Seven Emotions)' in traditional Korean medicine to analyze the perceived somatization symptoms, the relationship between somatization symptoms and core emotions, and variables influencing somatization symptoms among the participants. The research findings indicated that somatization symptoms perceived by cancer patients were considered significant, with 41.7% experiencing symptoms at a moderate level or higher. Among the core emotions, 'Sa (Depression),' excessive thinking, was the highest. And it was also revealed that experiencing six out of the seven core emotions, excluding 'Hee (Joy),' significantly correlated with physical symptoms. Variables influencing somatization symptoms in cancer patients were found to be cancer pain and 'Bi (Sorrow)' among the core emotions, which had the most significant influence.

1. Introduction

Cancer has been the leading cause of death among Koreans since the 1980s, according to statistics from the Ministry of Health and Welfare. In 2021, the incidence of cancer was 526.7 per 100,000 people, with an average annual increase of 3.3%. Moreover, with the improvement of healthcare standards, the 5-year relative survival rate of cancer patients increased to 72.1% from 2010 to 2019, indicating that more than two out of three cancer patients are expected to survive for over five

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years (National Cancer Information Center, 2023). Cancer has evolved into a chronic disease requiring long-term and systematic care, rather than being perceived solely as a life-threatening disease (Lee et al., 2011). Therefore, various researches were administered to actively diagnose and manage the psychological and emotional states experiences by cancer patients during the course of the disease or treatment in order to enhance their quality of life (Andritsch et al., 2007; Hobbs et al., 2022).

Cancer patients are experiencing physical conditions due to biological aspects of the tumor itself, physical stress from treatment, environmental changes during hospitalization, and fear of death (Kim, 2005). They are also experiencing psychological, social, and spiritual hardship due to changes in social relationships and roles, energy depletion, and disruptions in sleep and rest lead to nausea and pain (Kim, 2005). Most cancer patients find themselves in an emotional abyss upon receiving a cancer diagnosis, having negative and distressing emotions such as anxiety and depression for several weeks (Hegel et al., 2006). When cancer patients receive a treatment, they often experience a complex array of psychological states and reactions, including shock, fear, denial, Sorrow, anger, and despair, rather than hope for a cure (Fox, 1995). This perception of imminent death can lead to various challenges in their daily lives, manifested both psychologically and physically in the form of somatization symptoms (Fox, 1995).

Somatization symptoms primarily refer to the phenomenon where psychological variables such as emotional anxiety and stress manifest as physical symptoms. These symptoms are known to stem more from psychological causes rather than actual medical conditions. Patients' complaints of somatization symptoms often result from a significant mixture of both medical and psychological causes (Park, 1984). Somatization symptoms are maintained and triggered by complex interactions between emotional aspects such as depression and anxiety, attention to bodily sensations, amplified perception, negative interpretation of minor bodily sensations, and cognitive biases of physical causes (Shin, 2000).

When examining the emotional state of cancer patients, they initially may exhibit feelings of anxiety and depression (Wang et al., 2023), and appear emotional numbness or detachment (Kwekkeboom & Seng, 2002). Additionally, they may experience guilt and sometimes exhibit emotions of self-blame (Block, Dafter, & Greenwald, 2006). This often leads to experiencing higher levels of stress. Such stress responses may be more severe during the acute phase; however, these reactions can also appear temporarily and subsequently diminish. Furthermore, cancer patients often display characteristics of cognitive fixation, actively seeking information while feeling overwhelmed and experiencing difficulty on concentration (Asher, 2011). As a result of these emotional states, cancer patients may exhibit loss of appetite and sleep disturbances, as well as an increase in complaints of various somatization symptoms, making it challenging to engage in daily activities (Fox, 1995).

Somatization symptoms are closely related to emotions. For example, feelings of anxiety can trigger somatization symptoms such as rapid heartbeat or breathing problem, while depression can cause symptoms such as fatigue, lethargy, and chronic pain. According to research on the emotions and somatization symptoms of cancer patients, it has been found that cancer patients tend to suppress emotional expression (Bae, 2009). This has been shown to contribute to somatization symptoms in cancer patients and to have an impact on poor prognosis in cancer treatment (Locke & Gorman, 1989).

Indeed, it has been reported that psychological and emotional states influence a patient's somatization symptoms. However, there is a lack of research on the specific emotional states or emotions that

trigger somatization symptoms and their associative relationships. Cancer survivors commonly experience psychological symptoms such as fear of recurrence, stress, anxiety, and depression. Among these, anxiety is the most prevalent symptom, affecting approximately 18-20% of cancer survivors (Grotmol et al., 2017). Depression often co-occurs with anxiety symptoms, and these anxiety and depression symptoms have the most significant effect on the quality of life of cancer survivors (Park et al., 2018). In addition to symptoms directly related to the disease itself, such as cancer pain, cancer patients often experience various somatization symptoms throughout the ongoing treatment stages. These symptoms negatively impact the patients' treatment outcomes and diminish their quality of life, which is emphasizing the importance of psychological and emotional therapy as a crucial aspect of healthcare management for cancer patients (Chae & Kim, 2013).

In this study, we utilized the concept of 'Chiljeong(Seven Emotions)' from traditional Korean medicine to investigate the association between emotions and somatization symptoms in cancer patients. The concept of 'Chiljeong' in traditional Korean medicine and emotions in psychology represent two different approaches to explaining human emotions, originating from Eastern traditional medicine and Western modern psychology, respectively. In Korean traditional medicine, 'Chiljeong' is a significant concept used to understand the health and disease of the human body (Lee et al., 2014). It explains how seven types of emotions impact the body's functions and health. In modern psychology, emotion can be seen as a response to stimuli or events (Lee et al., 2015). The prototype of emotion is defined as a set of interrelated psychological processes involving definitional, cognitive, physiological, and motivational components, comprising cognition, feeling, and behavior to a specific event (Lee et al., 2014). Therefore, the concept of 'Chiljeong' can be categorized into core seven emotions: Hee (Joy), No (Anger), Sa (Depression), Woo (Thought), Bi (Sorrow), Gong (Fear), and Gyeong (Fright) (Lee et al., 2015). Based on these core seven emotions, Core Emotional Assessment Questionnaire (CEAQ) was developed (Lee et al., 2015).

In this study, we aimed to analyze the association between core seven emotions of cancer patients and the somatization symptoms they perceive using CSEI-S (Cheong et al., 2019), the short form of Core Seven-Emotions Inventory(CSEI), which is a revised version of CEAQ. We examined the relationship among these core seven emotions and identify emotional variables influencing somatization symptoms to use it as foundational data for the development of effective nursing interventions.

2. The Purpose of the Study

This study aimed to investigate the relationship between somatization symptoms perceived by cancer patients and their core emotions and identify emotional variables influencing somatization symptoms. The purpose of this study were as follows; First, identify the general characteristics of the patients. Second, assess the disease-related characteristics of the patients. Third, understand the somatization symptoms and their core seven emotions perceived by the patients. Fourth, confirm the relationship between the somatization symptoms and core seven emotions of the patients. Fifth, examine the differences in somatization symptoms based on disease-related characteristics of the patients. Sixth, analyze the emotional variables influencing somatization symptoms in the patients.

3. Definition of Terms

3.1 Somatization symptoms

Somatization symptoms are defined as physical symptoms as the expression of psychological or social difficulties (Lipowsky, 1988). It can be described as experiencing physical symptoms rooted in psychological problems. These symptoms typically manifest as unexplained physical symptoms that cannot be medically explained.

3.2 Core seven emotions

Core emotions are a conceptualization of the traditional Korean medicine classification system of emotions, known as 'Chiljeong' into modern psychological terms. They are categorized into seven core emotions: Hee (Joy), No (Anger), Sa (Depression), Woo (Thought), Bi (Sorrow), Gong (Fear), and Gyeong (Fright). 'Hee (Joy)' is further divided into two variables: positive emotional states such as joy and pleasure, and pathological euphoric emotional states. 'No (Anger)' encompasses feelings of anger or resentment in response to specific events such as blame or frustration, as well as feelings of irritation and annoyance that arise without clear stimuli or events. It includes aggressiveness, impulsivity, and contentious (verbal) aggression. 'Sa (Depression)' refers to excessive thinking, thought, depression, and obsessive thoughts, which can lead to difficulties in concentration, indecisiveness, and anticipatory anxiety. It encompasses behavioral manifestations such as difficulty in attention and inconsistency. 'Woo (Thought)' is regarded as a state of sorrow or melancholy, incorporating variables utilized in depression illustrations and depression related scales to establish its conceptual framework. As behavioral indicators of depression, 'Woo (Thought)' is seen through measures such as lethargy (fatigue), loss of appetite, decreased interest, self-deprecation, feelings of worthlessness, excessive guilt, hopelessness, and suicidal ideation. 'Bi (Sorrow)' shares similarities with 'Woo (Thought),' but it is distinguished by its propensity to express and vent emotions. Therefore, crying is considered the primary characteristic of sorrow. 'Sorrow' is understood to include mourning, loneliness (isolation), feelings of despair regarding irreparable situations, and crying as a behavioral measure. 'Gong (Fear)' can be characterized by the element of avoidance, as it triggers behaviors aimed at avoiding danger. Therefore, 'Gong (Fear)' is perceived as encompassing fear, a sense of loss of control, and avoidance of social situations. The expression of 'Gyeong (Fright)' includes autonomic nervous system responses such as palpitations, dizziness, feeling like fainting which bears similarities to the startle response in modern psychology.

4. Materials and Methods

4.1 Patients and data collection

This study was conducted with approval from the Institutional Review Board (IRB) of W University

Hospital. The sample size for this study was determined using G-Power 3.1 software, which calculated that a minimum of 150 participants would be required to maintain a power of 0.85 at a significance level of 0.05, with a medium effect size. Therefore, excluding patients with impaired consciousness or communication difficulties such as pediatric patients, the study targeted hospitalized patients at W University Hospital who understood the purpose of the research and agreed to participate in the survey. Data collection was conducted for two months, from June to August 2022. The survey was conducted through one-on-one interviews with nurses, and considering the dropout rate, it was administered to a total of 180 participants.

4.2 Research tool

4.2.1 The somatization symptom scale

In this study, to measure the somatization symptoms experienced by cancer patients, the Patient Health Questionnaire (PHQ) developed by Kroenke et al. (2002) was used. This tool consists of a total of 15 items designed to measure somatization symptoms. Each item is rated on a three-point Likert-scale of 'not bothered at all (0 point)', 'bothered a little (1 point)', and 'bothered a lot (2 point)'. Scores range from 0 to 30 points, with higher scores indicating higher levels of somatization symptoms. Additionally, total scores of 1 to 4 points indicate minimal levels, 5 to 9 points indicate mild levels, 10 to 14 points indicate moderate levels, and 15 to 30 points indicate severe levels of somatization symptoms. The Cronbach's α of the PHQ was .80 in Kroenke et al.'s (2002). In this study, the Cronbach's α was .88.

4.2.2 The Core Seven-Emotions Inventory

The core emotions of cancer patients were measured using The Core Seven-Emotions Inventory Short Form (CSEI-S) based on the traditional Korean medicine concept of 'Chiljeong' or the Seven Emotions. This scale consists of seven emotion variables each comprising 4 items. Each item is rated on a five-point Likert scale of 'not at all (1 point),' 'slightly (2 point),' 'moderately (3 point),' 'quite (4 point),' and 'very much (5 point).' Higher scores for each emotion indicate higher levels of emotion. The Cronbach's α of this study was .90.

4.3 Data analysis

The data collected in this study were analyzed using SPSS 29.0. The analysis procedure were as follows;

1) Frequencies, percentages, means, and standard deviations of the patients' general and disease-related characteristics were calculated.
2) Means and standard deviations of the patients' perceived somatic symptoms and core seven emotions were calculated.
3) Independent t-tests and ANOVA were conducted to test the differences in somatic symptoms according to disease-related characteristics.
4) Pearson's correlation coefficients were calculated to test the relationship between somatic symp-

toms and core seven emotions.

5) Multiple regression analysis was conducted to identify emotion variables influencing somatic symptoms.

5. Results

5.1 The general characteristics of the patients

The general characteristics of the patients are presented in Table 1. Out of 180 patients, there were 93 females (51.7%) and 87 males (48.3%). The average age was 61.35 years. Among the patients, those aged 60 or older accounted for the majority, with 98 individuals (54.4%). Among them, 131 patients (72.8%) had a spouse. Regarding education level, 66 patients (36.7%) were below high school, 67 patients (37.2%) were high school graduates, and 47 patients (26.1%) had a bachelor's degree or higher. The majority of patients (105, 58.3%) were unemployed. The monthly income less than 1 million won (67, 37.2%) was the most frequent. The primary caregiver was a spouse (89, 49.4%), children (43, 23.9%), self (26, 14.4%), and parents (11, 6.1%) in order. Regarding medical insurance, most patients were beneficiaries of medical insurance (167, 92.8%). The majority of patients (106, 58.9%) bore the burden of medical expenses themselves, followed by spouses (41, 22.8%).

Table 1. The general characteristics of the patients

Characteristics	Division	N	%	*M*±*SD*
Sex	Man	87	48.3	
	Woman	93	51.7	
Age(year)	20~39	11	6.1	61.32±13.45
	40~59	71	39.4	
	≥60	98	54.4	
Marital status	yes	131	72.8	
	no	49	27.2	
Education level	≤Middle school	66	36.7	
	High school	67	37.2	
	≥College	47	26.1	
Job	yes	75	41.7	
	no	105	58.3	
Religion	yes	78	43.3	
	no	102	56.7	
Monthly household income, thousand KRW	<1000	67	37.2	
	1000-2000	30	16.7	
	2000-3000	26	14.4	
	3000-4000	23	12.8	
	≥4000	34	18.9	

Table 1. Cont.

Characteristics	Division	N	%	*M*±*SD*
Primary caregiver	Spouse	89	49.4	
	Parents	11	6.1	
	Children	43	23.9	
	Self	26	14.4	
	Others	11	6.1	
Health insurance	Medical insurance	167	92.8	
	Medical protection	11	76.1	
	Private insurance	2	1.1	
Paying for treatment cost	Self	106	58.9	
	Spouse	41	22.8	
	Others	33	18.3	

N=180

5.2 Disease-related characteristics of the patients

Characteristics related to the disease of the patients were as follows (Table 2). The types of cancer of patients in order were colorectal cancer and rectal cancer (54, 30.0%), gastric cancer (30, 16.8%), breast cancer (29, 16.1%), thyroid cancer (24, 13.3%), hepatobiliary and pancreatic cancer (11, 6.1%), urogenital cancer (11, 6.1%), hematologic cancer (8, 4.4%), lung cancer (6, 3.3%), and other types of cancer (7, 3.9%). The stages of cancer among the patients were as follows; stage 1 or below (53, 29.4%), stage 2 (44, 24.4%), stage 3 (54, 30.0%), and stage 4 (29, 16.1%). The duration of cancer treatment were as follows; less than a year (76, 42.2%), over 2 years but less than 5 years (77, 42.8%), and over 5 years(27, 15.0%), with mean of 2.03 years. The type of therapy were chemotherapy (103, 57.2%), radiation therapy (52, 28.9%), surgery (126, 70.0%), hormone therapy (6, 3.3%), and other (13, 7.2%). 90(50.0%) patients had experienced cancer-related pain, while 118 (65.6%) patients had experienced other physical discomforts. Additionally, 90(50.0%) patients had diseases unrelated to cancer.

Table 2. Characteristics related to the disease of the patients

Characteristics	Division	N	Percentage	*M*±*SD*
Cancer type	Stomach cancer	30	16.8	
	Colorectal cancer	54	30.0	
	Hepatobiliary pancreatic cancer	11	6.1	
	Breast cancer	29	16.1	
	Thyroid cancer	24	13.3	
	Genitourinary cancer	11	6.1	
	Lung cancer	6	3.3	
	Hematologic cancer	8	4.4	
	Others	7	3.9	

Table 2. Cont.

Characteristics	Division	N	Percentage	*M*±*SD*
Cancer stage	< Stage I	53	29.5	
	Stage II	44	24.4	
	Stage III	54	30.0	
	Stage IV	29	16.1	
Duration of illness (year)	< 1 year	76	42.2	2.03±2.21
	≥2 years ~ < 5 years	77	42.8	
	≥5 years	27	15.0	
Treatment*	Chemotherapy	103	57.2	
	Radiotherapy	52	28.9	
	Surgical therapy	126	70.0	
	Hormone therapy	6	3.3	
	Others	13	7.2	
Cancer pain	Yes	90	50.0	
	No	90	50.0	
Physical discomfort	Yes	118	65.6	
	No	62	34.4	
Other diseases	Yes	90	50.0	
	No	90	50.0	

N=180, *multiple responses

5.3 Somatic symptoms and core seven emotions of the patients

The somatic symptoms perceived by the patients were as follows; 52 (28.9%) patients at the minimal level, 53 (29.4%) patients at the mild level, 48 (26.7%) patients at the moderate level, and 27 (15.0%) at the severe level, with mean of 8.57. The means of core emotions were as follows; 'Sa (Depression)' 9.74, 'Hee (Joy)' 8.79, 'Bi (Sorrow)' 8.69, 'Woo (Thought)' 7.74, 'No (Anger)' 7.18, 'Gyeong (Fright)' 6.99, and 'Gong (Fear)' 6.98.

Table 3. Somatic symptoms and core emotions of the patients

Characteristics	Division	N(%)	Range	*M*±*SD*
Somatic symptoms			0~22	8.57±5.38
	Minimal	52(28.9)		
	Mild	53(29.4)		
	Moderate	48(26.7)		
	Severe	27(1.0)		
Core emotion	Hee(Joy)		4~19	8.79±3.07
	No(Anger)		4~17	7.18±2.79
	Sa(Depression)		4~19	9.74±3.59
	Woo(Thought)		4~17	7.74±3.21
	Bi(Sorrow)		4~20	8.69±3.72
	Gong(Fear)		4~17	6.98±2.96
	Gyeong(Fright)		4~19	6.99±3.13

N=180

5.4 Differences in somatic symptoms according to the patients' disease-related characteristics

The difference in somatic symptoms according to the patients' disease-related characteristics is presented in Table 4. There were significant differences in somatic symptoms in the experience of cancer pain (t=5.477, p<.001) and physical discomfort (t=5.262, p<.001) among the patients' disease-related characteristics. Additionally, patients undergoing hormone therapy showed higher levels of somatic symptoms compared to non-treatment groups (t=2.469, p=.014).

Table 4. Differences in somatic symptoms according to the patients' disease-related characteristics

Characteristics	Division	*M±SD*	*t/F*	*p*
Cancer type	Stomach cancer	7.60±5.39	1.023	.421
	Colorectal cancer	8.70±5.61		
	Hepatobiliary pancreatic cancer	7.00±5.12		
	Breast cancer	10.24±5.59		
	Thyroid cancer	7.75±5.05		
	Genitourinary cancer	9.81±4.99		
	Lung cancer	11.00±1.79		
	Hematologic cancer	6.63±6.74		
	Others	8.29±5.38		
Cancer stage	< Stage I	7.81±4.87	1.022	.384
	Stage II	8.14±5.65		
	Stage III	9.07±5.66		
	Stage IV	9.68±5,32		
Duration of illness (months)	< 1 year	8.03±5,27	1.958	.144
	≥2 years ~ < 5 years	9.47±5.45		
	≥5 years	7.56±5.30		
Treatment*	Chemotherapy	9.09±5.22	1.490	.138
	Radiotherapy	8.73±5.44	.251	.802
	Surgical therapy	8.57±5.12	.003	.998
	Hormone therapy	13.83±7.31	2.469	.014*
	Others	7.54±5.85	.718	.474
Cancer pain	Yes	10.61±5.00	5.477	<.001***
	No	6.53±4.99		
Physical discomfort	Yes	10.00±5.16	5.262	<.001***
	No	5.86±4,74		
Other diseases	Yes	8.96±5.02	.955	.341
	No	8.19±5.56		

N=180 *p<.05, ***p<.001

5.5 The correlation between somatic symptoms and core emotions of the patients

The relationship between somatic symptoms and core emotions of the patients is presented in Table 5. Somatic symptoms perceived by the patients showed positive correlations with 'No (Anger)' (r=.381, p<.001), 'Sa (Depression)' (r=.409, p<.001), 'Woo (Thought)' (r=.470, p<.001), 'Bi (Sorrow)' (r=.538, p<.001), 'Gong (Fear)' (r=.458, p<.001), and 'Gyeong (Fright)' (r=.495, p<.001).

Table 5. The correlation between somatic symptoms and core emotions in the patients

	Hee (Joy)	No (Anger)	Sa (Depres-sion)	Woo (Thought)	Bi (Sorrow)	Gong (Fear)	Gyeong (Fright)
				r(p)			
Somatic symptoms	-.105 (.156)	.381 (<.001***)	.409 (<.001***)	.470 (<.001***)	.538 (<.001***)	.458 (<.001***)	.395 (<.001***)

N=180, ***p<.001

5.6 Variables influencing somatic symptoms of the patients

The result of the multiple regression analysis to identify the variables influencing somatic symptoms of the patients is presented in Table 6. To determine the variables influencing somatic symptoms, variables that showed significant associations with somatic symptoms, such as the experience of cancer pain and core emotions, were included in the multiple regression analysis. As a result, the variable significantly influencing somatic symptoms was the experience of cancer pain and the core emotion of 'Bi (Sorrow).' The Adjusted R^2 value for the entire regression model was .352 (F=12.173, p < .001), indicating that the explanatory power of the measurement variables used in this study was 35.2%. The most influential emotion variable on somatic symptoms was 'Bi (Sorrow)' among the core emotions (β=.268, p<.05), followed by cancer pain (β=.192, p<.01). In other words, the higher the level of sorrow and cancer pain, the more severe the somatic symptoms experienced by the patients.

Table 6. Variables influencing somatic symptoms in the patients

	β	t	p	Adjusted R^2	F	p
(constant)				.352	13.173	<.001**
Cancer pain	.192	2.946	.004*			
Joy	-.028	-.411	.681			
Anger	.122	1.672	.096			
Depression	.023	.273	.785			
Thought	.057	.594	.553			
Sorrow	.268	2.457	.015*			
Fear	.062	.643	.521			
Fright	.124	1.465	.145			

N=180, *p<.05, **p<.001

6. Discussion

The score of somatic symptoms perceived by cancer patients was on average 3.88 points, with moderate to severe levels accounting for 41.7% of the sample. When compared to the findings of Kang and Shin (2011) who had studied somatic symptoms in the elderly (7.38), the somatic symptom scores were lower in cancer patients, but the severity of somatic symptoms experienced by cancer patients was higher than the elderly. Cancer patients often complain of various somatic symptoms, including cancer-related pain, which are perceived more severely compared to somatic symptoms associated with aging. Considering cancer patients' persistent somatic symptoms even after the cancer has been cured (Cella et al., 2001), research on psychosocial interventions for somatic symptoms in cancer patients is necessary.

The highest core emotion of cancer patients' was excessive thinking, 'Sa (Depression, 9.74).' 'Depression' signifies excessive thinking, thought, and obsessive thoughts, encompassing stress responses such as difficulty on concentration, indecisiveness, and anticipatory anxiety in cancer patients. Cancer patients often exhibit severe stress responses during the acute phase of the illness. As the treatment process continues, their psychological state is closely associated with uncertainty about prognosis, making it deeply intertwined with cancer patients' psychology.

In this study, cancer patients who experienced cancer-related pain or physical discomfort showed higher levels of somatization symptoms. Among cancer patients, approximately 35% experienced moderate to severe uncontrolled physical pain at the time of diagnosis, which increased to about 70% in progressive cases and 80-90% in advanced stages of cancer (McMillan, 1996). In our study, cancer patients exhibited diverse stages of cancer progression, with around 50% of patients experiencing cancer-related pain and various physical discomforts. Thus, it is anticipated that physical symptoms would manifest accordingly. Additionally, patients receiving hormone therapy showed higher levels of somatization symptoms compared to other treatments. Hormone therapy is primarily used in the treatment of breast cancer or prostate cancer, and patients undergoing hormone therapy often experience not only physical symptoms but also overall disruptions in daily life, sometimes leading to treatment discontinuation (Oberguggenberger et al., 2011). The results of our study indicate that patients receiving hormone therapy manifest somatization symptoms across various aspects of their bodies, emphasizing the need for attention to the somatization symptoms of cancer patients undergoing hormone therapy, prioritizing these symptoms over other treatments.

The analysis of the correlation between core emotions and somatic symptoms revealed that all emotions except 'Hee (Joy),' i.e., 'No (Anger),' 'Sa (Depression),' 'Bi (Sorrow),' 'Gong (Fear),' 'Gyeong (Fright),' and 'Woo (Thought),' were positively correlated with somatic symptoms, indicating that the higher the intensity of these emotions, the more patients experienced somatic symptoms. Furthermore, the influencing variables on somatic symptoms in cancer patients were cancer-related pain and the emotion of 'Bi(Sorrow)' among core emotions. Most cancer patients not only experience cancer-related pains but also sorrow for them to cause psychological shock, conflict, and physical pain to their families during the treatment process. Consequently, experiencing feelings of sorrow directly influence the somatic symptoms of patients themselves.

7. Conclusions

The study was conducted with 180 inpatients at a university hospital to investigate the perception of somatic symptoms and core seven emotions among cancer patients, and to identify variables influencing somatic symptoms. The study findings revealed that cancer patients perceive somatic symptoms seriously, with 41.7% experiencing symptoms above a moderate level. Among core seven emotions 'Sa (Depression)' was the highest, and six emotions out of seven, except for happiness, were significantly associated with somatic symptoms. Variables influencing somatic symptoms in cancer patients were cancer-related pain and the emotion of 'Bi (Sorrow).' In conclusion, since the pain and somatic symptoms of cancer patients are significantly associated with core emotions such as sadness, enhancing the quality of life for cancer patients through both medical pain management and emotional support measures is necessary.

Based on these results, the following recommendations are proposed. Firstly, in nursing practice, since cancer-related pain and the emotion of 'Bi (Sorrow)' were identified as the primary variables contributing to somatic symptoms in cancer patients, it is essential to implement measures for emotional support throughout the treatment process. In addition to direct medical interventions for cancer treatment, efforts should be made to manage feelings of sorrow through psychological counseling with experts and support groups where patients can share experiences and receive encouragement from others facing similar situations. Secondly, it is necessary to expand the research scope by considering various characteristics of cancer patients and to conduct quantitative studies with other variables that influence somatic symptoms in cancer patients. Additionally, qualitative research investigating the emotions of cancer patients at a deeper level is needed.

Conflicts of Interest

The authors declare no conflict of interest.

References

Andritsch, E., Dietmaier, G., Hofmann, G., Zloklikovits, S., & Samonigg, H. (2007). Global quality of life and its potential predictors in breast cancer patients: An exploratory study. *Supportive Care in Cancer, 15* (1), 21-30.

Asher, A. (2011). Cognitive dysfunction among cancer survivors. *American Journal of Physical Medicine & Rehabilitation, 90* (5), S16-S26.

Bae, S. H. (2009). *Cultural techniques for dealing with anger in cancer patients* (Doctoral dissertation). Kyung Hee University, Seoul, Korea.

Block, K. I., Dafter, R., & Greenwald, H. P. (2006). Cancer, the mind, and the problem of self-blame. *Integrative Cancer Therapies, 5* (2), 123-130.

Cella, D., Davis, K., Breitbart, W., & Curt, G. (2001). Cancer-related fatigue: Prevalence of proposed

diagnostic criteria in a United States sample of cancer survivors. *Journal of Clinical Oncology, 19* (14), 3385-3391.

Chae, S. Y., & Kim, K. H. (2013). Physical symptoms, hope and family support of cancer patients in the general hospitals and long-term care hospitals. *Journal of Adult Nursing, 25* (3), 298-311.

Cheong, M. J., Lee, G.-E., Lee, Y., Bae, K.-H., Kang, Y., Kim, J.-H., Lyu, Y. S., & Kang, H. W. (2019). Validation of the Core Seven-Emotions Inventory-short form. *Integrative Medicine Research, 8* (2), 116-119.

Fox, B. H. (1995). The role of psychological variables in cancer incidence and prognosis. *Oncology, 9* (3), 245-256.

Grotmol, K. S., Lie, H. C., Hjermstad, M. J., Aass, N., Currow, D., Kaasa, S., Moum, T. Å., Pigni, A., Loge, J. H. on behalf of the Euroean Palliative Care Research Collaborative(EPCRC) (2017). Depression-A major contributor to poor quality of life in patients with advanced cancer. *Journal of Pain and Symptom Management, 54* (6), 889-897.

Hegel, M. T., Moore, C. P., Collins, E. D., Kearing, S., Gillock, K. L., Riggs, R. L., Clay, K. F., & Ahles, T. A. (2006). Distress, psychiatric syndromes, and impairment of function in women with newly diagnosed breast cancer. *Cancer, 107* (12), 2724-2731.

Hobbs, K., Davies, C. C., & Monroe, M. (2022). Breakthrough cancer pain: What outpatient oncology nurses need to know. *Clinical Journal of Oncology Nursing, 26* (5), 559-563.

Kang, J. S., & Shin, M. K. (2011). The influence of disease, anger trait and anger expression on the somatization symptoms of the elderly dwelling in a city. *Stress Research, 19* (4), 343-350.

Kim, N. K. (2005). *Cancer Treatment Guide*. Seoul: Iljogak.

Kroenke, K., Spitzer, R. L., & Williams, J. B. (2002). The PHQ-15: Validity of a new measure for evaluating the severity of somatic symptoms. *Psychosomatic Medicine, 64*, 258-266.

Kwekkeboom, K. L., & Seng, J. S. (2002). Recognizing and responding to post-traumatic stress disorder in people with cancer. *Oncology Nursing Forum, 29* (4), 643-650.

Lee, E. K., Ryu, E. J., & Kim, K. H. (2011). Structural equation modeling on adjustment of cancer patients receiving chemotherapy. *Journal of Korean Oncology Nursing, 11* (12), 101-107.

Lee, G.-U., Park, B.-Y., Kim, H.-Y., Lyu, Y.-S., & Kang, H.-W. (2014). A preliminary study on the development of the Core Emotional Assessment Instrument based on the Chiljeong. *Journal of Oriental Neuropsychiatry, 25* (1), 109-122.

Lee, G.-U., Park, B.-Y., Moon, K.-S., You, J.-M., & Kang, H.-W. (2015). A study on the development of the Core Emotional Assessment Questionnaire (CEAQ) based on the seven emotions. *Journal of Oriental Neuropsychiatry, 26* (2), 143-160.

Lipowsky, Z. J. (1988). Somatization: The concept and its clinical application. *American Journal of Psychiatry, 145*, 1358-1368.

Locke, S. E., & Gorman, J. R. (1989). Behavior and immunity. In H. I. Kaplan, & B. J. Sadock (Eds.), *Comprehensive Textbook of Psychiatry (pp. 1243-1245)*. Baltimore: Williams & Wilkins.

McMillan, S. C. (1996). Pain and pain relief experienced by hospice patients with cancer. *Cancer Nursing, 19* (4), 298-307.

National Cancer Information Center (2023). *2021 Cancer Statistics Annual Report*.

Oberguggenberger, A., Hubalek, M., Sztankay, M., Meraner, V., Beer, B., Oberacher, H., Giesinger, J.,

Kemmler, G., Egle, D., Gamper, E.-M., Sperner-Unterweger, B., & Holzner, B. (2011). Is the toxicity of adjuvant aromatase inhibitor therapy underestimated? Complementary information from patient-reported outcomes (PROs). *Breast Cancer Research and Treatment, 128* (2), 553-561.

Park, L., Jun, S., & Lee, J.-A. (2018). Quality of life and associated factor among cancer survivors in Korea. *Korean Journal of Health Promotion, 18* (1), 7-14.

Park, Y. N. (1984). Clinical study on psychiatric outpatients with somatic complaints. *Keimyung Medical Journal, 3*, 169-174.

Shin, H. K. (2000). The effects of negative affectivity, alexithymia, somato-sensory amplification, and somatic attribution on somatization: Test of a linear mediation model. *Korean Journal of Clinical Psychology, 19* (1), 17-32.

Wang, F., Zhang, S., Song, B., & Han, Y. (2023). Anxiety, depression, and quality of life in postoperative non-small cell lung cancer patients under the intervention of cognitive behavioral stress management. *Frontiers in Psychology, 14*, 1138070.

Yoo, Y. -S., Kwon, B. -E., Kim, H. -K., Park, Y. -R., Ahn, K. -J., Eom, M. -R., Eun, Y., Cho, K. -S., & Choi, S. -H. (2021). *Medical Surgical Nursing* (8th Ed.). Hyunmoonsa.