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Predictors of symptom experience in Korean patients with cancer undergoing chemotherapy

Hee Sun Kim [a], Eui Geum Oh [b, *], Hyangkyu Lee [b], Soo Hyun Kim [c], Hyun Kyung Kim [d]

[a] Department of Nursing, Wonkwang University, 460 Iksandae-ro, Iksan, Jeollabuk-do 570-749, Republic of Korea
[b] Division of Clinical Nursing Science, Nursing Research Policy Institute, College of Nursing, Yonsei University, 250 Seongsan-Ro, Seodaemun-Gu, Seoul 120-752, Republic of Korea
[c] Department of Nursing, Inha University, 100 Inha-ro, Nam-gu, Incheon 402-751, Republic of Korea
[d] College of Nursing, Chonbuk Research Institute of Nursing Science, Chonbuk National University, 567 Baekje-daero, Deokjin-gu, Jeonju-si, Jeollabuk-do 561-756, Republic of Korea

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A B S T R A C T

Purpose: This study aimed to investigate symptom experience and identify the predictors of symptom experience in cancer patients undergoing chemotherapy.
Method: This study was a cross-sectional and descriptive design. A total of 167 participants were recruited from the outpatient department of a university hospital in South Korea. Symptom experience (symptom prevalence, severity, and interference with daily activities), physiological factors (absolute neutrophil count, hemoglobin), psychological factors (depression, fighting spirit), and a situational factor (social support), based on the Theory of Unpleasant Symptoms, were measured. Descriptive statistics and multiple regression analyses were performed.
Results: Symptom prevalence ranged from 74.3% to 98.8% of patients. The five most severe symptoms were fatigue, numbness/tingling, dry mouth, sleep disturbance, and drowsiness. General activity and work were the most affected areas of daily life. Symptom experience was significantly related to hemoglobin, depression, fighting spirit, and social support. In the multiple regression analysis, higher level of depression and lung cancer accounted for 20.2% of the variance in symptom severity. Higher level of depression, lower level of fighting spirit and third or fourth-line chemotherapy accounted for 31.0% of the variance in symptom interference.
Conclusions: Attention is drawn to developing a comprehensive approach which considers relevant physiological, psychological and social factors in assessment and management of concurrent symptoms in cancer patients undergoing chemotherapy. Health care professionals need to play a key role in helping patients deal with depressive mood and promote fighting spirit, particularly in patients with lung cancer or patients treated with higher-line chemotherapy, for controlling their symptom experience.

Introduction

Cancer is the leading cause of death in South Korea (27.8% of all deaths) and results in an enormous physical, emotional, and financial burden (National Cancer Information Center, 2012). Cancer and its treatment frequently produce multiple symptoms that may range from mild to severe in patients (Cleeland et al., 2013; Deshields et al., 2011). For example, approximately 22%–30% of patients who are undergoing active treatment experienced more than five concurrent symptoms such as pain, fatigue, insomnia, dry mouth, and feeling sad (Kim et al., 2009).

Chemotherapy is a major cancer treatment that is associated with several physical adverse effects and psychological and behavioral problems including fatigue, appetite loss, numbness, dry mouth, nausea, vomiting, and depression (Yamagishi et al., 2009). If the symptoms are not properly controlled, they may influence treatment and alter long-term cancer outcomes by decreasing a patient's adherence with the treatment regimen and physical or psychological condition (Nakaguchi et al., 2013). For these reasons, accurate identification and management of symptoms experienced

* Corresponding author. Division of Clinical Nursing Science, Nursing Research Policy Institute, College of Nursing, Yonsei University, Republic of Korea. Tel.: +82 2 2228 3256; fax: +82 2 392 5440.
E-mail addresses: joha0219@wku.ac.kr (H.S. Kim), euigeum@yuhs.ac (E.G. Oh), HKYULEE@yuhs.ac (H. Lee), soohyun@inha.ac.kr (S.H. Kim), kimhk@jbnu.ac.kr (H.K. Kim).

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by patients undergoing chemotherapy are important to achieve appropriate anticancer treatment.

According to the Theory of Unpleasant Symptoms (TOUS) (Lenz et al., 1997), a symptom can occur in isolation or lead on to another symptom, and each symptom is conceptualized as a multidimensional experience considering the timing (frequency of occurrence), intensity (severity of the symptom), distress (level of perceived distress), and quality (the patient's description of what the symptom feels like). It is acknowledged that physiological (e.g., pathologic problems), psychological (e.g., mood state) and situational factors (e.g., social support) are interrelated and may interact to influence symptom experience.

Patients with cancer experience more than a single symptom (Kim et al., 2009), and these symptoms are linked to characteristics of the disease and treatments. Cancer patients with advanced stage, poor performance status, active treatment, higher-line chemotherapy and specific chemotherapeutic agent (e.g., taxanes, vinca-alkaloids, and platinum compounds) experience more intense symptoms (Cleeland et al., 2013; Zabernigg et al., 2012). However, a few studies have examined the relationships among sociodemographic and clinical characteristics and symptoms in patients undergoing chemotherapy, and these findings are inconsistent (Cleeland et al., 2013; Deshields et al., 2011; Kim et al., 2009).

In patients with cancer, neutropenia, determined by the absolute neutrophil count (ANC), is a common toxicity caused by chemotherapy that can lead to infection and diminish the efficacy of anticancer treatment (Fortner and Houts, 2006), and this toxicity is also related to symptoms (Given et al., 2005). Anemia is a common condition, and the relationship between anemia and fatigue is universally accepted in patients with cancer (Sobrero et al., 2001). However, the relationships among the ANC, hemoglobin levels, and symptom experience in patients with cancer undergoing chemotherapy are less well known.

Depression coexists with physical symptoms at a frequency of approximately 25% in patients with advanced cancer, and patients with depression reported a higher frequency and intensity of symptoms (Delgado-Guay et al., 2009). It has been reported that about 24%–36% of patients undergoing chemotherapy or radiotherapy have depressive mood, which is associated with fatigue and sleep disturbance and affect the quality of life (Ho et al., 2015; So et al., 2009). Depression is also connected with worse pain control, poorer compliance and less desire for long term therapy (Gregurek et al., 2010). Thus, diagnosis and treatment of depression in people receiving chemotherapy is crucial. Fighting spirit is characterized by a determination to fight the illness and the adoption of an optimistic attitude an important factor in adjusting to cancer. It includes three components; namely optimism about the prognosis, a belief that the disease and or its effects are controllable, and a determination to cope with the situation using various active coping methods (Watson et al., 1988).) Fighting spirit is correlated with cancer-related fatigue and general activity in cancer patients (Modlińska et al., 2014), and it has a significant effect on depression (Alcalar et al., 2012). However, there is little evidence that fighting spirit may be related with symptom experience in patients with cancer.

Social support includes satisfaction with areas such as appraisal, affection, tangible help with tasks, communication of helpful information and guidance and social companionship from family, friends, or health care professionals (Sherbourne and Stewart, 1991; Queenan, Feldman-Stewart, Brundage, Groome, 2010). Social support may control negative outcomes of cancer by mitigating symptom experience (Walsh, 2005). Personal support from family and friends is positively related to quality of life and mediates the effects of symptoms such as insomnia, fatigue, and loss of appetite in breast cancer (Walsh, 2005). As perceived social support decreased, symptom severity increased in cancer patients receiving adjuvant treatment (Ochayon et al., 2014). In addition, cancer survivors with lower level of social support experienced higher level of pain and depressive symptoms (Hughes et al., 2014). Thus, it is necessary to identify the level of depression, fighting spirit, and social support, as well as their consequences concerning disease or treatment-related symptoms in cancer patients undergoing chemotherapy.

In order to develop symptom assessment and management strategies for symptoms in patients with cancer undergoing chemotherapy, identification of the predictors of symptom experience is necessary. Little is known about the prevalence and severity of chemotherapy-related symptoms and how they affect daily life in Korean patients with cancer, and limited research effort has been directed toward exploring associating factors with symptoms based on the TOUS. More evidence is needed as a basis for formulating a comprehensive and effective model of care that decreases the symptom experience in Korean patients with cancer undergoing chemotherapy.

Aim

In the current study, symptom experience was defined as symptom prevalence, severity and interference with daily activities and assumed that symptom experience was influenced by physiological factors (ANC and hemoglobin levels), psychological factors (depression and fighting spirit), and situational factors (social support), which were selected based on the TOUS, and by sociodemographic and clinical characteristic of patients (Fig. 1). Therefore, the purposes of this study were to (1) explore the symptom experience, (2) investigate the ANC and hemoglobin levels, depression, fighting spirit, and social support, and (3) identify the predictors of symptom experience in patients with cancer undergoing chemotherapy.

Methods

Study design and participants

This study was a cross-sectional descriptive design, and the data were obtained via a secondary analysis of screening data collected as part of a study that developed and tested an explanatory model for sleep disorders in people with cancer (Kim and Oh, 2011).

A convenience sample of 167 patients with cancer was recruited from the outpatient clinic at a national university hospital in South Korea. The inclusion criteria were as follows: (1) age $\geq$ 20 years, (2) receipt of chemotherapy within the last month, (3) an Eastern Cooperative Oncology Group performance status (ECOG PS) score of 0–3, (4) no history of psychiatric disorders, and (5) an ability to cognitively respond to the questionnaires. Post hoc power analyses computed the power value (1- β) using a given sample size, an effect size, and an alpha level using the G*Power 3.0 program. The sample size was determined for the required multiple regression analysis, and the analysis considered a medium effect size of 0.15, an α of 0.05, and nine independent variables, which were statistically associated with symptom experience at the univariate level. A sample of 167 showed a statistical power value (1- β) of 0.95.

Measures and instruments

In this study, symptom experience was defined as a total score of the M.D. Anderson Symptom Inventory (MDASI) (Cleeland et al., 2000). The MDASI assesses 13 items of symptom severity and 6 items of symptom interference within the past 24 h. Each symptom severity is rated on an 11-point scale (0 = "not present," 10 = "as bad as you can imagine"). The interference scale assesses the