

Original Article

Using Chemical Drugs and Medicinal Plants for Symptom Management among Patients Receiving Chemotherapy

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ABSTRACT

Background: Patients with cancer suffer from different symptoms which can cause discomfort, reduce quality of life, necessitate frequent hospitalization, and impose heavy costs. Health-care providers sometimes overlook symptom management, and hence, patients resort to self-treatment. **Objectives:** This study sought to assess the use of chemical drugs and medicinal plants for the symptom management among patients receiving chemotherapy. **Methods:** This cross-sectional study was conducted in 2017 on 186 cancer patients who referred to two chemotherapy centers in Kashan, Iran. Data were collected using a researcher-made instrument consisted of items on demographic characteristics, symptoms, symptom severity and duration, use of chemical drugs and medicinal plants, and their perceived effectiveness. Data were presented using the measures of descriptive statistics and were analyzed using the Spearman's correlation analysis. **Results:** The most common symptom was fatigue (89.2%), with moderate severity in 51.2% of participants. The least common symptom was vomiting (24.2%), with mild severity in 62.2% of participants. Vitamins and supplements were the most commonly used chemical drugs (40.3%). Chemical drugs had mostly been recommended by health-care providers. Only, 50% of patients with pain and 12.2% of patients with dry mouth and oral ulcer used chemical drugs. Medicinal plants were used by 87.4% of participants, without medical prescription. **Conclusion:** Cancer patients suffer from many symptoms which need careful assessment and effective management by health-care providers. These patients use medicinal plants more commonly than chemical drugs for symptom management, whereas chemical drugs are more effective. Symptom management among cancer patients is not effective enough, and hence, most of them resort to over-the-counter medicinal plants.

KEYWORDS: *Cancer, Chemical drugs, Herbal medicine, Symptom*

INTRODUCTION

Cancer is the second-leading cause of death in the world. In 2017, 1,688,780 new cases of cancer and 600,920 cases of cancer-related death were reported in the United States.^[1] Cancer is also the third-leading cause of death in Iran. The incidence of cancer in Iran has significantly increased in the past two decades, and now, 85,000 new cases of cancer are diagnosed annually.^[2,3]

Chemotherapy is the most common treatment for cancer. Patients with cancer experience many different symptoms such as fatigue,^[4] nausea, vomiting,^[5]

constipation,^[6] numbness in the hands and the feet,^[7] pain, and depression^[8] due to both cancer and chemotherapy. These symptoms can cause discomfort, reduce quality of life, necessitate frequent hospitalizations, and impose heavy costs on families and health-care systems.^[9]

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Together with other health-care providers, nurses, particularly oncology nurses are responsible for symptom assessment and management among cancer patients.^[10] Although some symptoms and problems associated with cancer and chemotherapy can be managed using simple modalities, health-care providers sometimes do not pay careful attention to them.^[5,11] Therefore, patients may resort to self-treatment for managing their symptoms.^[12,13]

Herbal and chemical products are commonly used by the patients without any medical prescription.^[4,14] The most common drugs used by these patients include opioids, antiemetics, laxatives, corticosteroids, gastric protectors,^[15] analgesics, and antibiotics.^[16] In Iran, many patients may resort to self-treatment for the management of their symptoms.^[13] They may use energy therapy, herbal products recommended by neighbors and relatives, and even opioids. However, there is limited information about cancer patients' needs and symptom management behaviors. The present study was conducted to fill this gap.

Objectives

This study sought to assess the use of chemical drugs and medicinal plants for symptom management among patients receiving chemotherapy.

METHODS

Design and participants

This cross-sectional study was conducted in two chemotherapy centers in August–December 2017 in Kashan, Iran. The study population consisted of all patients who had been diagnosed with cancer by oncologists and were receiving chemotherapy. Sampling was done conveniently. The inclusion criteria were definite diagnosis of cancer, receiving chemotherapy, age between 18 and 85, having psychological and cognitive health, not having an acute problem, ability to answer the study instruments, and willingness to participate in the study. In an earlier study,^[17] 37% of patients with cancer used herbal remedies concurrent with chemotherapy. Then, with a confidence level of 0.95 and a d (measurement error) of 0.07, the sample size was estimated to be 186.

Instruments

A two-part researcher-made instrument was used for data collection. The first part of the instrument was a demographic characteristics questionnaire with items on age, gender, insurance status, cancer type, chemotherapy history, and the awareness of cancer diagnosis. The second part was a symptom questionnaire with 14 items

on the following symptoms: Pain, fatigue, vomiting, insomnia, anorexia, constipation, low mood, nausea, diarrhea, cough, dysuria, mouth ulcer, dry mouth, and dyspnea. Each item included scales for assessing symptom severity and duration. Patients were asked to rate the severity of each symptom from 1 to 10. Severity scores were classified as mild (scores 1–3), moderate (scores 4–6), and severe (scores 7–10). The symptom duration was assessed using a three-point scale as "Always", "Often", or "Sometimes". Moreover, there were the items on symptom management methods such as using medicinal plants and chemical drugs, number of used drugs, and person who recommended their use. A three-point scale was also used to assess the effectiveness of the used plants and drugs in reliving symptoms. The points of the scale were "Highly effective," "Moderately effective," and "Ineffective." The validity of the symptom questionnaire was confirmed by 11 instructors from the Kashan Faculty of Nursing and Midwifery, Kashan, Iran. The items' content validity ratio (I-CVR) ranged from 0.59 to 0.72, and the scale CVR (S-CVR) was 0.63. The items' content validity index ranged from 0.78 to 1, and the scale CVR was 0.81. The reliability of the questionnaire was also examined on 13 patients and confirmed with a Cronbach's alpha of 0.87.

For data collection, we referred to the chemotherapy centers in Shahid Beheshti and Yasrebi Hospitals, recruited eligible participants, and completed the study instrument for them through personal interviews held in a waiting room. Interviews were held before the onset of chemotherapy sessions and lasted for 30 min, on average.

Ethical considerations

The Ethics Committee of Kashan University of Medical Sciences, Kashan, Iran, approved this study (code: IR.KAUMS.NUHEPM.REC.1396002). The objectives of the study were explained to the participants, and they were ensured that their participation in the study would be voluntary, and their data would be managed confidentially. Written informed consent was obtained from each participant, and all the questionnaires were kept anonymous.

Data analysis

Statistical analysis was done using the SPSS software program version 13.0 (SPSS Inc., Chicago, IL, USA). Descriptive measures such as frequency and percent were used for data presentation. The Spearman's correlation analysis was used to assess the correlation between the number of using drugs/plants and their perceived effectiveness. All analyses were performed at a significance level of <0.05 .

RESULTS

In total, 186 patients participated in this study, of which 51.1% of them were female and 58.1% of them aged more than 50. Around 95.2% of participants had insurance, 75.3% of them were aware of their diagnosis, and 38% of them had previous history of chemotherapy. They suffered from the cancers of the breast (23.1%), colon (21%), bones (11.3%), lung (7%), prostate (3.8%), cervix (3.8%), liver (3.2%), lymph nodes (2.7%), brain (8.06), kidney (5.37%), testis (4.3%), and Hodgkin lymphoma (6.45%).

As Table 1 shows, fatigue was the most common symptom among participants, with a prevalence of 89.2% and moderate severity in 51.2% of participants. Around 44.57% of participants reported that they often experienced fatigue. Other common symptoms were dry mouth (63.9%), insomnia (62.4%), anorexia (61.8%), pain (61.3%), constipation (54.8%), low mood (52.7%), nausea (46.8%), mouth ulcer (32.8%), dyspnea (32.3%), and cough (28%). The least common symptom was vomiting, with a prevalence of 24.2% and mild severity in 62.2% of participants. The number of symptoms reported by participants was 6.7 ± 2.6 , on average.

The average number of chemical drugs used by the participants for symptom management was 2.0 ± 1.50 . Vitamins and supplements were the most commonly used chemical drugs (40.3%) followed by antiemetics (37.1%) and sedatives (29.6%). Only 19.8% of participants reported the use of nonsteroidal anti-inflammatory drugs and 10.7% of them used opioids. The highest perceived effectiveness was related to mouth wash (86.36%) and antiemetics (76.8%) [Table 2].

For 50% of participants, health-care providers had recommended chemical drugs for managing the symptoms such as pain, nausea, vomiting, and insomnia. However, only 12.2% of participants had been recommended to use drugs for the symptoms such as dry mouth and mouth ulcer [Table 3].

Around 87.4% of participants reported the use of medicinal plants and 16.7% of them used four plants. The most commonly used medicinal plants were *Zingiber officinale* for vomiting management (38.7%), mentha for gastric pain (36%), and *Cichorium intybus* for liver function improvement (30.6%). The highest perceived effectiveness was related to Senna (77.7%) and *Plantago ovata* (69.7%), both for constipation management [Table 4]. The average number of medicinal plants used by the participants was 2.1 ± 1.6 . On average, the number of chemical drugs and medicinal plants used by participants was 4.1 ± 2.3 . There was a statistically significant correlation between perceived effectiveness and the number of used chemical drugs ($r = 0.96$; $P = 0.0001$) and medicinal plants ($r = 0.922$; $P = 0.0001$).

DISCUSSION

The findings showed fatigue as the most common symptom among patients with cancer. Former studies also reported fatigue as a common symptom among these patients.^[6,18,19] Most patients with cancer experience some levels of fatigue during the course of their treatment, and approximately 30% of them suffer from persistent fatigue for several years after the treatment.^[20-22]

The findings also showed that with a prevalence of 40.3%, Vitamins and supplements were the most

Table 1: The frequency, severity, and duration of symptoms among cancer patients

Symptoms ^a	Frequency	Severity			Duration		
		Mild	Moderate	Severe	Sometimes	Often	Always
Fatigue	166 (89.2)	20 (12.04)	85 (51.20)	61 (36.74)	30 (18.07)	74 (44.57)	62 (37.34)
Dry mouth	119 (63.9)	37 (31.09)	58 (48.73)	24 (20.16)	55 (46.21)	50 (42.01)	14 (11.76)
Insomnia	116 (62.4)	-	-	-	30 (25.86)	50 (43.10)	36 (31.03)
Anorexia	115 (61.8)	36 (31.30)	47 (40.86)	32 (27.82)	38 (33.04)	53 (46.08)	24 (20.86)
Pain	114 (61.3)	29 (25.43)	48 (42.1)	37 (32.45)	47 (41.22)	47 (41.22)	20 (17.54)
Constipation ^b	102 (54.8)	81 (79.41)	15 (14.70)	6 (5.88)	40 (39.21)	52 (50.98)	10 (9.80)
Low mood	98 (52.7)	40 (40.81)	46 (46.93)	12 (12.24)	51 (52.04)	39 (39.79)	8 (8.16)
Nausea	87 (46.8)	41 (47.12)	32 (36.78)	14 (16.09)	49 (56.32)	36 (41.37)	2 (2.29)
Dysuria	66 (35.5)	-	-	-	17 (25.75)	24 (36.36)	25 (37.87)
Mouth ulcer	61 (32.8)	-	-	-	-	-	-
Dyspnea	60 (32.3)	30 (50)	24 (40)	6 (10)	30 (50)	24 (40)	6 (10)
Cough	52 (28)	32 (61.53)	15 (28.84)	5 (9.63)	34 (65.38)	14 (26.92)	4 (7.69)
Diarrhea ^c	51 (27.4)	28 (54.9)	21 (41.17)	2 (3.92)	31 (60.78)	11 (21.56)	9 (17.64)
Vomiting ^d	45 (24.2)	28 (62.22)	11 (24.44)	6 (13.33)	30 (66.66)	12 (26.66)	3 (6.66)

^aData presented as n (%), ^bSeverity includes the number of defecations per week: Mild: More than four times; Moderate: 3–4 times; and Severe: 1–2 times, ^cSeverity includes the number of defecations in 24 h: Mild: 1–3 times; Moderate: 3–6 times; and Severe: More than six times, ^dSeverity includes the number of vomiting episodes in 24 h: Mild: 1–3 times; Moderate: 3–6 times; and Severe: More than six times

commonly used drugs by patients with cancer. Vitamins and supplements were mostly used for fatigue management. Around 98.6% of participants who used vitamins and supplements took them with medical prescription. Similarly, two former studies reported that 33%–82% of cancer patients received supplements, particularly calcium and vitamins.^[22,23] Some physicians believe that nutritional supplements can alleviate physical weakness in patients with cancer,^[23] though there is no consistent evidence regarding the positive effects of nutritional supplements on fatigue management.^[22] Another justification for the high prevalence of Vitamin and supplement use in the present

study may be the higher number of female patients in the study sample. Compared with men, women more frequently use vitamins and supplements due to their physical conditions.^[23]

We also found dry mouth as a common symptom among the participants, though its severity was mainly mild. A former study on patients with advanced cancer also reported that the dry mouth was prevalent in these patients.^[16] Dry mouth and mouth ulcer can reduce nutritional intake, quality of life, and ability to tolerate treatments. Therefore, these problems need effective medical management. We also found that the prevalence of mouth ulcer was 32.8%. Similarly, a study reported that 40% of cancer patients suffered from mouth ulcer.^[24] The prevalence of this problem largely depends on the number of chemotherapy courses and the type of chemotherapy regimen. Chemotherapy-induced altered immunity^[25] can be another reason for the difference among studies in terms of the prevalence of dry mouth and mouth ulcer.

Despite the high prevalence of mouth ulcer and dry mouth and the high perceived effectiveness of mouth wash in the present study, only a small percentage of our participants used it. Maintaining oral health and reducing the risk of mouth infection are the primary goals of mouth care in patients with cancer. Regular use of oral care measures, such as brushing, flossing, rinsing, and moisturizing are important in maintaining a clean oral cavity.^[26]

Insomnia was the third-most common symptom, and sedatives were the third-most commonly used drugs in the present study. A former study showed insomnia as a common problem among patients with cancer and reported that cancer severity was directly correlated with insomnia severity.^[27,28] Insomnia can result in poor daily functioning, anxiety, serious injuries, and increased mortality rate among patients with cancer. However, more than 50% of our participants reported poor insomnia

Table 2: The frequency and the perceived effectiveness of chemical drugs used by cancer patients

Chemical drugs ^a	Frequency	Perceived effectiveness		
		High	Low	Ineffective
Vitamins and supplements	75 (40.3)	33 (44)	41 (54.66)	1 (1.33)
Antiemetics	69 (37.1)	53 (76.81)	13 (18.84)	1 (1.44)
Sedatives	55 (29.6)	36 (65.45)	18 (32.72)	1 (1.81)
Laxatives	42 (22.6)	21 (50)	16 (38.09)	5 (11.90)
NSAIDs	37 (19.8)	21 (56.75)	11 (29.72)	5 (13.51)
Mouth wash	22 (11.8)	19 (86.36)	3 (13.63)	0
Opioids	20 (10.7)	10 (50)	9 (45)	1 (5)
Anti-diarrhea	12 (6.4)	8 (66.66)	4 (33.33)	0

^aData presented as n (%), NSAIDs: Nonsteroidal anti-inflammatory drugs

Table 3: The frequency of drug use for the management of each symptom

Symptoms ^a	Patients	Drug use	Perceived effectiveness		
			High	Low	Ineffective
Dry mouth and mouth ulcer	180 (96.7)	22 (12.22)	13 (24.07)	39 (72.22)	2 (3.70)
Insomnia	116 (62.3)	55 (47.41)	23 (31.94)	47 (65.27)	2 (2.77)
Pain	114 (61.3)	57 (50)	23 (69.69)	7 (21.21)	3 (9.09)
Constipation	102 (54.8)	42 (41.17)	10 (45.45)	10 (45.45)	2 (9.09)
Diarrhea	51 (27.4)	12 (23.52)	37 (55.22)	30 (44.77)	0
Fatigue	166 (89.2)	75 (45.18)	14 (53.84)	12 (46.15)	0
Nausea and vomiting	132 (78.9)	69 (52.27)	29 (50.87)	26 (45.61)	2 (3.50)

^aData presented as n (%)

Table 4: The frequency and perceived effectiveness of medicinal plants used by cancer patients

Medicinal plants ^a	Frequency (%)	Perceived effectiveness		
		High	Low	Ineffective
<i>Cinnamomum verum</i>	54 (29)	13 (24.07)	39 (72.22)	2 (3.70)
<i>Zingiber officinale</i>	72 (38.7)	23 (31.94)	47 (65.27)	2 (2.77)
<i>Plantago ovata</i>	33 (17.7)	23 (69.69)	7 (21.21)	3 (9.09)
<i>Rosa × damascena</i>	22 (11.8)	10 (45.45)	10 (45.45)	2 (9.09)
Mentha	67 (36)	37 (55.22)	30 (44.77)	0
<i>Descurainia sophia</i>	26 (14)	14 (53.84)	12 (46.15)	0
<i>Cichorium intybus</i>	57 (30.6)	29 (50.87)	26 (45.61)	2 (3.50)
<i>Senna</i>	9 (4.8)	7 (77.77)	2 (22.22)	0
<i>Crocus sativus</i>	8 (4.3)	2 (25)	6 (75)	0

^aData presented as n (%)

management. Benzodiazepines were the most common sedative agents they used for insomnia management. All of them reported that they used benzodiazepines based on health-care providers' recommendations. These findings may be due to health-care providers' greater attention to rest- and sleep-related problems among patients with cancer. The other reason may be the fact that sedatives are not easily accessible without medical prescription. The prevalence of benzodiazepine use in a former study was 7.9%,^[29] which is lower than the rate in our study. These discrepancies are attributable to the differences between the studies in terms of participants' personal characteristics, psychological and socioeconomic status, and previous history of insomnia.

The study findings also showed that 61.3% of participants experienced pain, whereas its severity was moderate in 42.1% of cases. A former study reported that 30%–60% of patients who received chemotherapy had pain and attributed pain to the factors such as the underlying disease, surgery, chemotherapy, radiation therapy, and subsequent neuropathy.^[30] Despite the high prevalence of pain in the present study, only 50% of participants used opioids or nonsteroidal anti-inflammatory drugs for pain management. Unlike our findings, a study reported opioids as the most commonly used drugs among patients with cancer.^[15] This contradiction may be due to the differences between the studies respecting participants' personal characteristics, cancer type, and pain threshold, severity, and frequency. The limited use of opioids or nonsteroidal anti-inflammatory drugs in the present study can be attributed to the weaknesses in cancer pain management protocols in the study setting, where pain management was mainly done by physicians. Cancer patients need effective pain management through nonopioids, opioids, and adjuvant therapies^[29] because pain can be associated with problems such as depression, anxiety, and psychological disorders.^[31]

Vomiting was the least common symptom in the present study with mild severity in 62.2% of cases. This is consistent with the findings of a former study^[19] and inconsistent with the findings of another study.^[11] This inconsistency may be due to the differences between the studies in terms of chemotherapy regimen, antiemetic drugs, and patient tolerance. The low prevalence of vomiting in the present study may be due to the fact that almost all patients under chemotherapy receive antiemetics. Our findings also showed that antiemetics as the second most commonly used drugs and their effectiveness was high. A former study reported that 25% of patients admitted to palliative care units were estimated to have nausea and this rate reached to 75% among patients with advanced cancer. That study

showed that 85% of patients received antiemetics.^[32] Although our participants mainly received antiemetics and reported their great effectiveness, 50% of them reported uncontrolled vomiting. Careful attention is needed to determine the reasons contributing to such high rate of uncontrolled vomiting despite the wide use of antiemetics.

Study findings also showed that the participants frequently used medicinal plants such as *Z. officinale*, *Mentha*, and *Cichorium intybus*. The majority of participants reported that medicinal plants were effective in alleviating their symptoms. *C. verum* has some anti-inflammatory effects,^[33] whereas *C. verum* and *Z. officinale* have antioxidant effects and are commonly used as spices.^[34] A former study also reported that cancer patients used *Z. officinale* for nausea management, *Linum usitatissimum* for constipation management, and *Echinacea angustifolia* for mouth ulcer management.^[35] In some countries, medicinal plants are easily accessible, and hence, are widely used. For instance, a study reported that cancer patients in Turkey widely used *Allium sativum* and *urtica* for their antioxidant effects.^[36] The high prevalence of over-the-counter use of medicinal plants may be due to their easy accessibility, low costs, unsupervised media advertisements for their use, and inadequate supervision over their selling.

One of the limitations of the present study was related to the limited generalizability of its findings due to the following factors. First, the study was conducted on a small sample of patients in a single city. Thus, further studies in different settings and on larger samples are recommended. Second, symptom assessment was done only once. Therefore, studies with frequent symptom measurements at different time points in the course of cancer treatment are recommended. Third, this study assessed only 14 prevalent cancers, chemotherapy-related symptoms and only chemical drugs and medicinal plants. Studies are needed to assess other symptoms and also other therapies used by cancer patients, including acupuncture and meditation.

CONCLUSION

Patients with cancer suffer from different symptoms which are not effectively managed in most cases. The study shows that compared with chemical drugs, medicinal plants are more widely used by patients with cancer for symptom management. Careful primary symptom assessment at the time of patient admission to health-care centers and follow-up assessment after discharge are recommended for early detection and effective management of symptoms. Educational interventions for health-care providers about the

importance of effective symptom management and commonly used medicinal plants are also needed. Future studies are recommended to assess symptoms and pharmacological and nonpharmacological therapies used for their management among larger samples of patients with different types of cancer.

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Conflicts of interest

There are no conflicts of interest.

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