Symptom Occurrence, Severity, and Self-Care Methods by Ethnicity and Age Group Among Adults With Cancer

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OBJECTIVES: To examine the relationships among cancer therapy–related symptom occurrence and severity, selected cancer-related variables, and demographic variables. Secondary purposes were to examine participants' reported symptom occurrence and severity by ethnicity and by age group and to identify self-care methods.

SAMPLE & SETTING: Convenience sampling was used and included 110 adults receiving cancer treatment from a major hospital in the northeast region of the United States.

METHODS & VARIABLES: A descriptive correlational design was used. Study variables were symptom occurrence and severity and selected demographic and cancer-related variables. The Therapy-Related Symptom Checklist was used to measure symptom occurrence and severity, and the Symptom Alleviation: Self-Care Methods tool was used to record self-care strategies.

RESULTS: Significant relationships were found between symptom occurrence and severity and gender, economic status, and disease stage. Feeling sluggish was the most frequently reported symptom.

IMPLICATIONS FOR NURSING: Oncology nurses are in an influential position to educate and manage participants' cancer therapy–related symptoms.

ancer is a major health problem in the United States, and it is the second leading cause of death, exceeded only by cardiac diseases (American Cancer Society [ACS], 2021b; Siegel et al., 2020). In 2021, about 1.9 million individuals are expected to be diagnosed with cancer in the United States, and about 608,570 cancer deaths are estimated to occur (ACS, 2021b). Cancer can lead to significant interference in individuals' physical, financial, and emotional well-being that affects families and society in general (Bernat Kolankiewicz et al., 2017; Drageset et al., 2014; World Health Organization, 2021).

Oncogenesis is a multifactorial process affected by various factors, such as inherited genetic variations, differences in lifestyle, environment, and tumor biology (Grenade et al., 2014; Schabath et al., 2016). Racial and ethnic differences affect oncogenesis, cancer incidence, mortality, symptom experience, treatment adherence, outcome, and survival. Certain racial and ethnic groups experience cancer disparities and have an increased risk of developing and dying from particular cancers. According to the National Cancer Institute (2020), Black/African American individuals have higher death rates from most types of cancers, such as breast and prostate cancer, compared to other racial and ethnic groups. Cultural beliefs and values also influence the entire way in which the meaning of and response to cancer are framed. Awareness of individuals' racial, ethnic, and cultural differences in symptom experience and identification of these high-risk individuals would help the treatment team to manage their symptoms effectively during aggressive treatments (Kagawa-Singer, 2011; Shi et al., 2015). The inclusion of different racial and ethnic groups enhances the generalizability of study results (Flanagin et al., 2021).

Cancer treatment involves the use of surgery, chemotherapy, radiation therapy, immunotherapy, targeted therapy, or hormone therapy. Most

individuals received a combination of treatments, such as surgery with radiation therapy and/or chemotherapy (National Cancer Institute, 2021). Individuals receiving cancer treatment often experience multiple coexisting symptoms caused by the disease itself, side effects of its treatment, and other related conditions (Jiménez et al., 2011; Miaskowski et al., 2017). Those with cancer respond differently to these treatments, and the incidence of side effects varies by treatment type. Common side effects related to cancer treatment include myelosuppression, insomnia, fatigue, alopecia, nausea, vomiting, taste changes, constipation, pain, depression, and shortness of breath (Batra et al., 2020; Crivelli et al., 2021; Liu et al., 2021; Savard et al., 2015; Williams, Mowlazadeh, et al., 2015).

Education and socioeconomic status are important factors that determine how individuals manage their cancer and treatment-related symptoms. Lower education and income are inversely related to cancer stage at diagnosis, cancer incidence, treatment adherence, and total symptom severity scores (Liu et al., 2017; Smailyte et al., 2015). Adolescents and young adults with cancer are vulnerable to distress because of their developmental stage and cancer diagnosis (Kwak et al., 2013).

Although effective symptom management and adequate supportive care during cancer treatment remain a challenge (Coolbrandt et al., 2018), oncology nurses were identified as a trusted source of information by participants and their caregivers (Tariman et al., 2014). Studies have reported oncology nurses' role in symptom assessment, monitoring, and management (Tariman & Szubski, 2015; Williams, Mowlazadeh, et al., 2015). However, there is a gap in the identification of individuals' symptoms and their self-care strategies. Evidence suggests the existence of poor communication of symptoms and self-care strategies among people with cancer (Coolbrandt et al., 2018). Individuals' management of symptoms is diversified and requires education, motivation, and individual-centered care from oncology nurses (Magalhães et al., 2020). Therefore, systematic tracking of patient-reported symptoms during cancer treatment and identification of inhibitors to the self-management process are essential for effective symptom management (Williams et al., 2014). Knowledge of the anticipated symptoms and their timely management will reduce symptom burden and enhance treatment adherence.

The primary purpose of this study is to examine the relationships among cancer therapy–related symptom occurrence, severity, selected variables related to the cancer condition (diagnosis and stage, type of treatment, length of current therapy, number of comorbidities), and selected demographic variables (age, gender, ethnicity, marital status, education, economic status). Secondary purposes were to examine participants' reported symptom occurrence and severity by ethnicity (African American versus White), self-care methods used by ethnicity, and difference in symptom occurrence and severity by age group (adolescents and young adults aged 18–39 years versus older adults aged 40 years or older).

Conceptual Framework

The study conceptual framework was a modification of frameworks developed by several scholars in this field (Armstrong, 2003; Dodd et al., 2001; Larson et al., 1994; Williams et al., 2001, 2013, 2014; Williams, Piamjariyakul, et al., 2006; Williams, Schmideskamp, et al., 2006). According to Larson et al. (1994), the symptom experience is a dynamic interaction of the participant's perception of a symptom, evaluation of its meaning, and response to a symptom. When considering the person, environment, and health and illness, Dodd et al. (2001) proposed interrelations among symptom experience, components of symptom management strategies, and symptom status and outcomes, including self-care, functional status, and quality of life. Armstrong (2003) proposed the following three components: antecedent factors (or factors that influence the symptom experience), symptom perception (including frequency and severity/intensity), and the consequences of the symptom. Williams et al. (2001, 2013, 2014); Williams, Piamjariyakul, et al. (2006); and Williams, Schmideskamp, et al. (2006) stated that information about common symptoms and monitoring the success of self-reported strategies can guide healthcare providers (HCPs) in optimizing help for individuals during cancer treatment. When HCPs assist individuals with cancer, they must be able to use (and guide individuals to use) medically prescribed treatment measures, including the use of self-care. The current study assumed the following:

- Demographic variables and cancer-related characteristics are associated with cancer therapy–related symptom occurrence and severity.
- Symptom occurrence and severity are associated with ethnicity and age group and will influence selection and use of self-care activities.

Methods

Design

The study used a descriptive correlational design. Adults undergoing cancer treatment were recruited

from inpatient and outpatient chemotherapy and radiation therapy departments of Lankenau Medical Center in Wynnewood, Pennsylvania. The hospital is located in a large metropolitan area and is recognized for its comprehensive oncology program, various cancer treatments, cancer research, and clinical trials. Data were collected from the following three groups of participants receiving cancer treatment: those receiving chemotherapy alone, those receiving radiation therapy alone, and those receiving a combination of chemotherapy and radiation therapy.

Sample

A convenience sampling method was used, with the intention for quota sampling by two variables: ethnicity (African American and White) and age group (adolescents and young adults aged 18–39 years and older adults aged 40 years or older). Race/ethnicity was self-reported by the study participants. Specifically, the sampling plan was for 110 participants to include half African American individuals and half White individuals and to include at least 30% of participants in the age group of younger than 40 years old. However, the actual study accrued only 10% (n = 11) of participants younger than 40 years of age. Sample size consideration used a rule of thumb for multiple linear regression of at least 10 participants per coefficient (Cleophas & Zwinderman, 2012). There were 11 independent variables.

Inclusion criteria were adult participants with cancer who had received at least one week of chemotherapy or radiation therapy; were at least 18 years old; had a score of 50 or greater on the Karnofsky Performance Status Scale (KPSS); were able to speak, read, and write English; had no history of mental illness; and signed the informed consent. Excluded were those who had only surgery without chemotherapy or radiation therapy, and those receiving palliative or hospice care. The study was approved by the institutional review boards (IRBs) of the author's university, the School of Nursing at the University of Kansas, and the study site, Lankenau Medical Center. Participants enrolled in the study were assigned an identification number.

Variables

The selected independent variables were as follows:

- Variables related to the cancer condition: diagnosis/stage, type of treatment, length of current therapy, number of comorbidities, type of treatment received (chemotherapy only, radiation therapy only, or a combination of chemotherapy and radiation therapy)

- Demographic variables: age, gender, ethnicity, marital status, education, economic status

The outcome (dependent variable) was symptom occurrence and severity as reported by the individuals with cancer.

Instruments

Therapy-Related Symptom Checklist: The Therapy-Related Symptom Checklist (TRSC) is a 25-item checklist for participants to self-report symptom occurrence and severity during cancer treatment (either chemotherapy and/or radiation therapy). The TRSC has good psychometric properties, which include concurrent, construct, and discriminant validity, and reliability with all Cronbach's alpha coefficients greater than 0.8 (Williams, Balabagno, et al., 2010; Williams et al., 2013; Williams, Lopez, et al., 2010; Williams, Mowlazadeh et al., 2015; Williams, Piamjariyakul, et al., 2015). The TRSC is a Likert-type participant self-report instrument with 14 subscales or symptom clusters. Participants were asked to report their symptom occurrence and rate the symptom severity on a five-point scale as follows: 0 (none), 1 (mild), 2 (moderate), 3 (severe), or 4 (very severe). Space to write in and rate other symptoms was provided. The ratings on the 25 items are summed (range = 0–100); higher scores (total score) on the TRSC indicate greater symptom frequency (occurrence) and severity (Williams et al., 2013; 2014; Williams, Piamjariyakul, et al., 2015).

Symptom Alleviation: Self-Care Methods tool: The Symptom Alleviation: Self-Care Methods (SA:SCM) tool was based on the TRSC. For each symptom, participants report self-care methods used for symptom alleviation. The SA:SCM tool also instructs participants to rate how often they use each self-care method, using a scale from 1 (seldom done) to 4 (very often done), and to indicate whether the method helped (yes or no) to relieve their symptoms. Cronbach's alpha greater than 0.7 has been reported for the SA:SCM tool (Williams et al., 2011). The following self-care strategies developed by Williams, Balabagno, et al. (2010); Williams, Lopez, et al. (2010); and Williams, Piamjariyakul, et al. (2006) were regrouped and used in the current study: diet and nutrition; lifestyle changes; spiritual, mind, and body control; herbal and vitamin treatment; medication; and other (do nothing/no response).

Health form, KPSS, and treatment/medication profile: The health form was used to collect information from the medical record on the participants' diagnosis, cancer stage, date treatment started, type of

TABLE 1. Sample Characteristics (N = 110)		
Characteristic	**n**	**%**
Age (years)		
18–39	11	10
40–59	35	32
60–79	57	52
80–99	7	6
Gender		
Female	63	57
Male	47	43
Ethnicity		
White	60	55
African American	40	36
Asian	8	7
Hispanic	2	2
Education		
High school diploma	49	45
College degree	44	40
Graduate degree	17	16
Marital status		
Married	60	55
Single	22	20
Divorced	15	14
Widowed	9	8
Other	4	4
Annual income ($)		
Less than 30,000	38	35
30,000–60,000	32	29
61,000–90,000	13	12
91,000–120,000	9	8
More than 120,000	16	15
Did not answer	2	2
Cancer diagnosis		
Breast	37	34
Colorectal	16	15
Lung and larynx	16	15
Uterine and ovarian	12	11
Lymphoma, leukemia, and myeloma	10	9
Oral and gastrointestinal	5	5
Other[a]	14	13
Cancer stage		
0	1	1
I	18	16
II	28	26
III	31	28
IV	26	24
		Continued in the next column

TABLE 1. Sample Characteristics (N = 110) *(Continued)*		
Characteristic	**n**	**%**
Cancer stage *(continued)*		
Not known	6	5
Number of comorbidities		
0	31	28
1	24	22
2	26	24
3	24	22
4	3	3
5	1	1
6	1	1
Treatment type		
Chemotherapy	48	44
Radiation therapy	36	33
Chemotherapy and radiation therapy	26	24
Weeks since treatment started		
2–10	86	78
11–20	17	16
21–30	4	4
31–40	2	2
41–50	1	1

[a] Prostate, testicular, renal, axillary, bone, and unknown origin
Note. Because of rounding, percentages may not total 100.

treatment, chemotherapy drugs, dose, and radiation therapy dose. KPSS rates the condition and activity/functional status of the participant receiving cancer treatment. Scores range from 0–100, and a higher score indicates a higher functional status (Williams et al., 2013). A score of 50 or greater indicates that the individual is able to live at home and able to care for most personal needs without much assistance. Functional status is based on the participant's ability to carry on normal activity, ability to work, and the requirement of assistance needed for daily activities. Various studies reported good psychometric properties of this tool. The Pearson product-moment correlation for inter-observer reliability was 0.89 (Schag et al., 1984), and the inter-rater reliability was 0.97 (Mor et al., 1984). This scale has been used extensively in clinical and oncology research (Piamjariyakul et al., 2010; Williams, Balabagno, et al., 2010; Williams, Lopez, et al., 2010).

Demographic data form: This form is a modification of those used in previous studies (Williams, Balabagno, et al., 2010; Williams et al., 2011; Williams,

Lopez, et al., 2010; Williams, Piamjariyakul, et al., 2006; Williams, Schmideskamp, et al., 2006) and is used to collect data about participants' age, gender, ethnic background, marital status, education, and economic status.

Data Collection Procedures

Recruitment: Participants were recruited through an IRB-approved flyer/advertisement. Information gathered from the participant, family, and clinical staff on the participant's level of functioning in terms of self-care ability, activity level, and physical ability was used to calculate KPSS score. The researcher collected demographic information from the participant and health history and treatment/medication profile information from the participant's medical record. Participants self-reported their symptoms on the TRSC and self-care strategies on the SA:SCM tool.

TABLE 2. Symptom Occurrence on the TRSC by Treatment Type (N = 110)			
	Chemo Alone (N = 48)	RT Alone (N = 36)	Chemo and RT (N = 26)
TRSC Subscale/Symptoms	**% Occurrence**	**% Occurrence**	**% Occurrence**
Pain	63	56	65
Numbness in fingers and/or toes	50	44	35
Bleeding	19	8	15
Hair loss	65	31	39
Skin changes	46	47	58
Constipation	60	28	50
Soreness in vein	13	8	19
Deceased interest in sexual activity	50	56	35
Fatigue			
Feeling sluggish	85	81	85
Depression	50	61	27
Difficulty concentrating	48	64	58
Difficulty sleeping	73	64	69
Eating			
Taste change	83	42	62
Loss of appetite	79	50	73
Weight loss	52	36	65
Difficulty swallowing	21	28	27
Oropharynx			
Sore mouth	42	17	31
Sore throat	31	19	23
Jaw pain	15	11	4
Fever			
Fever	13	14	8
Bruising	17	28	8
Nausea			
Nausea	54	39	54
Vomiting	19	8	19
Respiratory			
Cough	42	44	31
Shortness of breath	58	39	35
chemo—chemotherapy; RT—radiation therapy; TRSC—Therapy-Related Symptom Checklist			

Data Analysis

The data were analyzed using IBM SPSS Statistics, version 23.0. Independent two-sample t test, analysis of variance (ANOVA), and linear regression were used to perform the univariate analyses. Multiple linear regression analyses (stepwise, forward selection, and backward elimination methods) were conducted to finalize the independent variables related to symptom severity and occurrence (TRSC total scores). Independent two-sample t tests were conducted to examine the relationship between independent variables (gender, education, cancer stage, and time since treatment started) with symptom occurrence/severity. The relationship of age, ethnicity, economic

TABLE 3. Symptom Alleviation: Self-Care Methods by Category (N = 110)						
TRSC Subscale/Symptoms	**Diet and Nutrition**	**Lifestyle Changes**	**Spiritual, Mind, and Body Control**	**Herbal and Vitamin Treatment**	**Medication**	**Other (Do Nothing/ No Response)**
	n	**n**	**n**	**n**	**n**	**n**
Pain	–	1	1	1	35	74
Numbness in fingers and/or toes	–	12	3	1	6	92
Bleeding	–	–	–	–	3	107
Hair loss	–	–	19	–	–	91
Skin changes	–	-	1	1	20	90
Constipation	9	–	–	–	24	81
Soreness in vein	–	1	1	1	1	107
Deceased interest in sexual activity	–	2	2	–	–	106
Fatigue						
Feeling sluggish	3	42	10	3	2	59
Depression	1	5	13	1	5	89
Difficulty concentrating	1	4	9	1	2	95
Difficulty sleeping	2	7	12	–	17	73
Eating						
Taste change	28	3	2	3	1	68
Loss of appetite	26	3	2	1	1	69
Weight loss	18	–	–	4	2	92
Difficulty swallowing	11	1	2	2	2	97
Oropharynx						
Sore mouth	2	–	1	3	16	90
Sore throat	3	–	–	1	8	99
Jaw pain	2	–	–	–	3	107
Fever						
Fever	1	–	–	–	4	106
Bruising	–	–	–	–	1	109
Nausea						
Nausea	5	1	–	1	18	71
Vomiting	1	–	–	–	11	99
Respiratory						
Cough	1	–	1	–	9	99
Shortness of breath	–	18	2	–	1	92

TRSC—Therapy-Related Symptom Checklist
Note. Participants could select more than one method.

status, marital status, cancer diagnosis, and treatment type, with symptom occurrence and severity, were examined using ANOVA. An independent two-sample t test was conducted to examine the differences in symptom occurrence and severity by ethnicity and age group. Participants' reported self-care methods were addressed using content analysis.

Results

Sample Characteristics

All participants (N = 110) provided demographic information. Sample demographics and health-related information are shown in Table 1. Most participants were aged 60–79 years (n = 57), women (n = 63), and White (n = 60). Participants' annual income ranged from less than $30,000 to more than $120,000.

Symptom Occurrence and Severity

Findings were reported as the mean severity scores on all items in the TRSC and the percentage occurrence of each symptom with reference to each treatment type group (see Table 2). Among participants receiving chemotherapy alone, 50% or more reported 13 symptoms. Participants receiving radiation therapy alone had fewer symptoms (7). Those treated with both chemotherapy and radiation therapy reported 10 symptoms. Feeling sluggish was the most frequently (more than 80%) reported symptom among all three groups. The mean TRSC score for all participants was 21.58 (SD = 13.7). The mean TRSC total score for participants receiving chemotherapy alone was 24.69, radiation therapy alone was 19.22, and combined treatment with chemotherapy and radiation therapy was 19.12. Participants receiving chemotherapy alone reported the most severe symptoms compared to those receiving only radiation therapy and combined chemotherapy and radiation therapy.

Seven other symptoms (blood clot forming, hemorrhoids, nail changes, fingers locking up, shingles, infection, and joint/muscle pain) were added by participants receiving chemotherapy alone. Participants receiving radiation therapy reported abdominal pressure, cramping, and bloating and nail changes, and those with combined therapy had diarrhea, indigestion, low hemoglobin, feeling lonely, and skin cracks at the radiation site.

Self-care strategies reported on the SA:SCM tool were classified into the following six categories:

- Diet and nutrition (dietary changes, small meals)
- Lifestyle changes (rest, taking naps)
- Spiritual, mind, and body control (massage, yoga, meditation, prayer)
- Herbal and vitamin treatment
- Medication (ondansetron, laxatives, pain medications)
- Other (do nothing/no response)

Table 3 shows the self-care strategies used by all participants.

Association Between Symptom Occurrence and Severity and Selected Variables

Univariate analyses were conducted to examine the relationship between each independent variable and symptom occurrence and severity (as measured by TRSC total scores). There were no significant differences between gender and TRSC total scores ($t[108]$ = –0.74, p = 0.45) or education and TRSC scores ($t[108]$ = 0.17, p = 0.86). The relationship between other selected demographic variables and TRSC total scores was examined using ANOVA. A significant association was found between ethnicity (White, African American, and Asian/Hispanic) and TRSC total scores ($F[2, 107]$ = 3.34, p = 0.04), as well as economic status (annual income less than $30,000, $31,000–$60,000, and more than $60,000) and TRSC total scores ($F[2, 105]$ = 5.22, p = 0.007). Participants with higher income reported fewer symptoms. There was a significant relationship between TRSC total scores and cancer stage

TABLE 4. Linear Regression Analysis of Selected Variables and TRSC Total Scores (N = 104)

Variable	B	95% CI	t	p
Gender	4.93	[0.21, 9.64]	2.07	0.04
Economic status[a]	–6.27	[–11.19, –1.35]	–2.53	0.01
Cancer stage[b]	10.38	[5.6, 15.16]	4.31	0.000

[a] Annual income of less than $30,000 versus more than $60,000
[b] Stages 0, I, and II versus stages III and IV
B—unstandardized coefficients; CI—confidence interval; TRSC—Therapy-Related Symptom Checklist

(t[102] = –4.51, p ≤ 0.001). Disease stage was collapsed into two groups (stages 0, I, and II and stages III and IV) and length of current therapy into two groups (2–10 weeks and more than 10 weeks). Participants with cancer stages III and IV reported higher symptom occurrence and severity compared to those with stages 0, I, and II. There was no significant relationship between TRSC total scores and time since treatment started (t[108] = 0.47, p = 0.64). Univariate analysis findings provided a basic understanding of the relationship between selected independent variables and symptom occurrence and severity. Variables entered into model selection were those found significant in univariate analyses and other clinically relevant variables (based on clinical experience and literature support).

The variables included in the multiple linear regression analysis were gender, economic status (annual income more than $60,000), and cancer stage. Findings of the regression analysis (see Table 4) showed a significant relationship between selected independent variables of gender, economic status, cancer stage, and TRSC total scores (F[3,100] = 10.77, p = 0.000, R^2 = 0.24). Female participants reported significantly higher TRSC scores ($\overline{X}$ = 22.41, SD = 12.46) compared to male participants ($\overline{X}$ = 20.47, SD = 15.27). Participants with higher economic status and with cancer stages 0, I, and II reported lower symptom occurrence and severity.

Symptom Occurrence and Severity by Ethnicity

TRSC total scores of African American (n = 40) and White (n = 60) participants were compared using an independent two-sample t test. The mean TRSC score of African American participants was 25.95 (SD = 12.57), and that of White participants was 19 (SD = 13.29). There was a significant difference in symptom occurrence and severity (t[99] = –2.62, p = 0.01) between African American and White participants. African American participants reported higher symptom occurrence and severity.

Symptom Occurrence and Severity by Age Group

Mean TRSC scores of adolescents and young adults (18–39 years) was 27.55 (SD = 14.31), and that of older adults (40 years or older) was 20.92 (SD = 13.55). However, there were no significant differences in symptom occurrence and severity (t[108] = 1.53, p = 0.13) by age group.

Self-Care Methods Used to Alleviate Symptoms Reported by Ethnicity

Self-care methods used to alleviate symptoms were determined by content analysis, and medications

(prescribed and over-the-counter) were the most commonly used self-care strategy by White and African American participants. Lifestyle changes were the second most frequently reported self-care strategy by White participants, and that of African American participants was diet/nutrition. Feeling sluggish was the top-ranked symptom with maximum reported self-care strategies by White participants, and taste change was the top-ranked symptom relieved by self-care strategies among African Americans participants. In general, participants reported that their self-care methods were effective for symptom relief. Methods used to alleviate symptoms by African Americans participants were 100% effective for the most commonly reported symptoms of feeling sluggish, loss of appetite, difficulty swallowing, vomiting, cough, shortness of breath, and pain. Vomiting, cough, and numbness in fingers/toes were the three symptoms reported with the least effective self-care strategies by White participants. Hair loss, depression, and nausea were the three symptoms reported with the least effective self-care strategies by African American participants.

Discussion

The current study found a significant difference in symptom severity and gender. Female participants reported significantly higher symptoms compared to male participants, and this supports previous study findings (Bernat Kolankiewicz et al., 2017; Zhang et al., 2015). No significant relationship was found between age and symptoms, and marital status and symptoms, and this supports findings reported by Heinze et al. (2015). Participants with higher annual income reported lower symptom occurrence and severity. This is consistent with findings of prior studies that low-income levels predicted higher somatic symptom burden (Thomas et al., 2014) and high-risk participants with severe symptom clusters had low economic status (Langford et al., 2015).

Participants with a higher cancer stage reported higher TRSC scores, which is consistent with earlier studies (Mendoza et al., 2019; Zhang et al., 2015). Participants receiving chemotherapy alone reported the most severe symptom scores compared to those receiving radiation therapy and combined therapy. In contrast, Williams, Balabagno, et al. (2010) reported that participants receiving a combination of chemotherapy and radiation therapy reported the highest TRSC scores compared to those receiving chemotherapy alone and radiation therapy alone.

In the current study, 13 symptoms (feeling sluggish, depression, difficulty sleeping, taste change, loss of appetite, weight loss, nausea, shortness of breath, pain, numbness in fingers and/or toes, hair loss, constipation, and decreased interest in sexual activities) were reported by 50% or more of participants receiving chemotherapy alone. This is consistent with prior studies that reported a broad range of distressing side effects related to chemotherapy (Crivelli et al., 2021; Hutter et al., 2013; Kuo et al., 2015; Mols et al., 2014; Schneider et al., 2015; Williams et al., 2014; Williams, Mowlazadeh, et al., 2015). Feeling sluggish was the highest occurring symptom reported by all three groups, and this is consistent with prior studies (Abbott & Hooke, 2017; Williams & Bergquist-Beringer, 2018).

African American participants reported higher TRSC scores compared to White participants. Results are consistent with those reported by Martinez et al. (2014) that pain severity was higher for Black and multiracial participants compared to White participants. The current study did not find any significant difference in symptom occurrence and severity by age group (adolescents and young adults aged 18–39 years versus older adults aged 40 years or older). The most commonly used self-care strategy reported by both African American and White participants was medication, followed by lifestyle changes among White participants and diet and nutrition among African American participants. There are various studies reported in the literature about common cancer therapy–related symptom management, specifically the use of complementary and alternative medicine (Burch et al., 2020; Chui, 2019), self-affirmation, and nature sounds (Yildirim et al., 2017).

Theoretical Relevance

The current study assumed that selected demographic variables and cancer-related characteristics are associated with cancer therapy–related symptom occurrence and severity. Results from this study did not completely support all the assumed

relationships. However, the findings showed that gender, economic status, and cancer stage were significantly associated with symptom occurrence and severity. More research needs to be conducted using this conceptual framework to better understand the relationships between variables. This study's findings showed a significant difference in symptom occurrence and severity between African American and White participants, and findings suggest the importance of understanding racial/ethnic differences in cancer care.

The National Cancer Institute (2020) reported the existence of cancer disparity. African American individuals face obstacles related to cancer prevention, early detection, treatment, and survival. Cancer diagnosis at a later stage and lower survival rates have been associated with living in highly populated African American areas and segregated communities (ACS, 2021a). African American individuals also face racial discrimination at HCP visits, as reported by one-third of African American women (ACS, 2021a), and this may negatively influence their cancer treatment and participation in cancer research. Therefore, it is important to include diverse ethnic/racial groups in clinical research studies so that the results can be applied to all populations.

Limitations

The sample size was small (N = 110), and there were only 11 participants aged younger than 40 years. This limited analysis comparing adolescents and young adults (18–39 years) and older adults (40 years or older). The study used a cross-sectional design, and this limits the ability to make a causal inference. The data were collected only one time, and the results may have been different if another time frame had been chosen. A convenience sampling method was used in the study, which is another limitation. The current study was conducted in one healthcare system, limiting the generalizability of study findings.

Implications for Nursing

Oncology nurses are at the front line of all aspects of cancer-related care (Pongthavornkamol et al., 2018). Systematic tracking and prioritization of participant-reported symptoms and identification of factors that promote and inhibit self-management are essential for effective symptom management (Magalhães et al., 2020; Williams et al., 2014). The findings of the current study provide additional support for the use of the TRSC and SA:SCM tool in oncology nursing practice to identify individuals'

therapy-related symptoms and self-care strategies. However, there were many other symptoms added by study participants, which indicates the need for future studies to develop tools for symptom assessment. Various effective and noneffective self-care strategies were reported in this study, and future symptom management and research studies could build on these findings. Results from this study may also assist oncology nurses in providing education and counseling based on anticipated and identified needs to reduce symptom burden, enhance individuals' cancer experience across the illness trajectory, and improve treatment adherence and outcomes (Kolb et al., 2018; Kuo et al., 2015; Lopez et al., 2015; McCorkle et al., 2011; Williams et al., 2013).

Oncology nurses should provide education about potential symptoms and specific management to help individuals with cancer to manage their symptoms effectively (Bernat Kolankiewicz et al., 2017; Rha et al., 2020) and improve their confidence (Coolbrandt et al., 2018). Knowing that cancer therapy–related symptoms are highly prevalent and occur at any stage of cancer treatment, nurses can tailor prevention and provide appropriate intervention strategies to manage them effectively. Additional research is needed to identify the effectiveness of individual-centered education and various nursing interventions to manage participants' cancer therapy–related symptoms.

Conclusion

This study was a unique study that used the TRSC and SA:SCM tool during three types of cancer treatment (chemotherapy, radiation therapy, and combined chemotherapy and radiation therapy) to highlight participants' reported symptom occurrence and severity and self-care strategies. Although further research is needed, many individuals could benefit from a more comprehensive evaluation and greater use of available symptom assessment. This study's findings suggest the need for oncology nurses to identify and report vulnerable populations, capture the most commonly occurring symptoms, and educate patients properly to manage their symptoms at home. This, in turn, would reduce hospitalization and additional burden and enhance treatment adherence and outcomes. Individuals should also be encouraged to discuss their cancer therapy–related symptoms with their treatment team. Results from this study provide a basis for future research studies on monitoring of symptom occurrence and severity and self-care strategies among individuals with specific cancer types. In addition, this study's findings

may lead to future studies to develop individualized intervention strategies to manage cancer therapy–related symptoms.

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