Temporary Stoppages and Burden of Treatment in Patients With Cancer

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OBJECTIVES: To examine the effect of burden of treatment and multimorbidity on the relationship between baseline characteristics and oral oncolytic agent (OOA) temporary stoppages.

SAMPLE & SETTING: 272 patients newly prescribed OOAs at six National Cancer Institute–designated comprehensive cancer centers.

METHODS & VARIABLES: Patients were randomly assigned to an adherence and symptom management group or usual care/control group. Temporary OOA stoppages, symptom interference, OOA regimen complexity, and multimorbidities were explored. Data were collected at four-week intervals for 12 weeks.

RESULTS: Burden of treatment variables and multimorbidity had no significant effect on OOA temporary stoppages. Women and those prescribed kinase inhibitors were significantly more likely to experience a temporary stoppage.

IMPLICATIONS FOR NURSING: Oncology nurses are in a crucial position to educate patients on self-management of OOAs and symptoms. Nurses should be aware of patients who may be more susceptible to severe symptoms, including those with multimorbidities. Future research is needed to better understand OOA stoppages and factors associated with preventing stoppages.

Individual characteristics may play a role in the treatment regimens for patients with cancer. Age, sex, body mass index (BMI), race, and other characteristics have been extensively researched in patients with cancer to facilitate providers' decision-making ability regarding treatment plans (Tawfik et al., 2016). However, the presence of multimorbid conditions in patients with cancer brings about unique challenges for providers and patients (Sarfati, Koczwara, & Jackson, 2016). As life expectancy increases, the issue of cancer and multimorbidity will become a growing consideration for researchers and clinicians. For patients, the issue of cancer and multimorbidity brings about an increased number of tasks needed to manage their diseases, as well as their perspective of their cancer and multimorbidities and the associated workload. The workload for patients with cancer who are prescribed oral oncolytic agents (OOA) presents unique challenges because they experience greater responsibility for self-management than those treated with IV chemotherapy (Zerillo et al., 2017). Unlike IV chemotherapy, patients prescribed OOAs must manage their medications and side effects in the home (Salgado et al., 2017).

Burden of treatment (BOT) is defined as the combination of a patient's workload and his or her perspective of the condition and workload (Eton et al., 2015; Sav et al., 2013; Tran, Barnes, Montori, Falissard, & Ravaud, 2015). The need to examine this concept is related to the shift to shorter inpatient stays and a greater emphasis on patient self-management in the home and, therefore, a greater workload or burden (Pefoyo et al., 2015; Williams et al., 2016). Tran et al. (2015), Sav et al. (2013), and Eton et al. (2015) are the three primary contributors to BOT conceptual literature. Their work began with the conceptualization of BOT and, since then, they have started to empirically measure the concept within certain chronic disease populations.

The existing BOT literature has focused on several chronic conditions, including HIV/AIDS (Gao,

Nau, Rosenbluth, Scott, & Woodward, 2000; Lépine & Briley, 2011; Mrazek, Hornberger, Altar, & Degtiar, 2014), mental illness (Lepine & Briley, 2011; Mrazek et al., 2014), diabetes (Brown, Nichols, & Perry, 2004), cardiovascular diseases (Stange, Kriston, von-Wolff, Baehr, & Dartsch, 2013), cystic fibrosis (Sawicki et al., 2013), Celiac disease (Shah et al., 2014), hyperlipidemia (Ridgeway et al., 2014), asthma (Eton et al., 2013; Ridgeway et al., 2014), and stroke (Ridgeway et al., 2014; Tran et al., 2012). In addition, BOT has been examined among individuals with multimorbidity or the coexisting of more than one chronic condition (Pefoyo et al., 2015). These chronic condition studies have examined BOT through varied designs and variables of interest. Qualitative studies identified themes, such as tasks required of patients to manage their conditions, difficulties with access to care, the impact of tasks on self-management, identifying problem-solving techniques and coping strategies, the importance of social support, and positive aspects of the healthcare system (Ridgeway et al., 2014; Tran et al., 2015). Quantitative studies have used indicator variables to examine BOT as an outcome variable or predictor of patient and clinical consequences. Indicator variables were used in place of the actual variable or concept because it may be more feasible to collect the indicator variable rather than a BOT-specific measure. Examples of indicator variables include treatment complexity (Ridgeway et al., 2014; Sawicki et al., 2013), number of medications (Lhuilier, Brugeilles, & Rolland, 2015; Mrazek et al., 2014), number of interactions with healthcare providers (Cheng & Levy, 2017; Henry et al., 2008; Presley et al., 2017), and difficulty managing treatment (Lhuilier et al., 2015; Ridgeway et al., 2014; Shah et al., 2014).

Although studies have examined BOT across several chronic conditions, only three studies were found that examined BOT within individuals with cancer. Two of these studies analyzed secondary data from large data sets: SEER–Medicare (Presley et al., 2017) and an institutional cancer database (Cheng & Levy, 2017). The third study recruited patients from a national survey database and had direct contact with participants through online and telephone surveys (Henry et al., 2008). These studies operationalized BOT as the number of days interacting with the healthcare system, type of interaction (i.e., receiving cancer treatment, clinic visit, or emergency department/acute stay), number of physicians patients interacted with, number of medications, and symptom burden (Cheng & Levy, 2017; Henry et al., 2008; Presley et al., 2017). Cheng and Levy (2017) and

Henry et al. (2008) found that later-stage cancer and increased side effects from treatment were associated with increased burden of treatment. However, these studies did not examine the impact of multimorbidities on BOT.

Looking more specifically at cancer and multimorbidity within these studies, Presley et al. (2017) collected data on patients' multimorbid conditions and examined the impact on patients' BOT, using the number of days interacting with the healthcare system as an indicator for BOT. When comparing patients who received the same cancer treatment, they found that patients with three or more multimorbidities experienced a significantly higher level of burden than those with less than three multimorbidities. Although this is the only study that examined BOT within patients with cancer and multimorbidities, other research has illustrated the impact of multimorbidities on a number of patient and healthcare outcomes. These patient outcomes include symptoms and side effects, adverse events (e.g., hospitalizations), quality of life, functional status, increased costs, disease exacerbation, and mortality (Sarfati et al., 2016; Spoelstra et al., 2015; Sun et al., 2016; Verbrugghe et al., 2016; Williams et al., 2016; Winn, Keating, & Dusetzina, 2016).

Patients with cancer prescribed OOAs experience unique challenges when compared to patients receiving IV chemotherapy. Although trained healthcare professionals administer IV chemotherapy in a controlled environment, OOAs lack such firsthand monitoring, thereby shifting responsibility to patients and their caregivers (Arthurs et al., 2015; Bassan et al., 2014; Hall et al., 2016; Mathes, Antoine, Pieper, & Eikermann, 2014; Zerillo et al., 2017). OOA regimens provide a sense of convenience for patients via home administration. However, OOA regimens can be complex, comprising multiple OOAs with varying dosages, cycles (days on and days off), and specific instructions (Accordino & Hershman, 2013; Hall et al., 2016). These regimens increase patients' BOT and lead to difficulties in medication management and subsequent regimen modifications (Trivedi et al., 2014). Such modifications may include dose changes, temporary stoppages, permanent stoppages, and adding or switching a medication (McNamara et al., 2016; Salgado et al., 2017; Verbrugghe et al., 2016). Regimen modifications can be brought on by side effects and toxicities, interactions, patient and provider decisions, or disease progression (Salgado et al., 2017). OOA regimen changes can alter the effectiveness of the medication if patients are not receiving an adequate dose or require increased rest periods.

Individuals with cancer prescribed OOAs require more self-management than those receiving IV chemotherapy. Adding multimorbidities to complex OOA regimens increases the workload for patients to manage their conditions. Limited research has been conducted on BOT in individuals with cancer and multimorbidities who are prescribed OOAs. Because most cancer and multimorbidity management takes place in the home, it is imperative that patients and providers have open communication and effective education regarding side effects that can lead to treatment modifications. Effective communication is needed for providers to educate patients to properly manage their OOAs and symptoms and side effects, as well as multimorbidities.

The purpose of this study was to evaluate the effect of BOT indicator variables (OOA regimen complexity and symptom interference) on the relationship between baseline characteristics (age, sex, employment status, marital status, multimorbidity, OOA drug class, insurance type, and OOA copay) and OOA temporary stoppages. The objective was to determine what variables might have an impact on the OOA regimen modifications, as well as whether or not variables associated with the BOT might affect the direct relationship between baseline characteristics and OOA temporary stoppages. This study provides new evidence for clinicians to encourage patients to proactively seek care for early management of symptoms and insight for future research in patients with cancer and multimorbidities.

Methods

This study is a secondary data analysis of a two-arm, multisite randomized controlled trial testing adherence and symptom management interventions in patients with cancer who are newly prescribed OOAs (Sikorskii et al., 2018). Permission for this secondary analysis was granted by the principal investigators. The experimental arm received a weekly symptom assessment with referral to a symptom management toolkit for symptoms rated 4 or greater on a severity subscale and an adherence intervention comprised of daily reminders using an automated interactive voice response system. Participants in the control group received standard care without toolkit referrals or reminder calls.
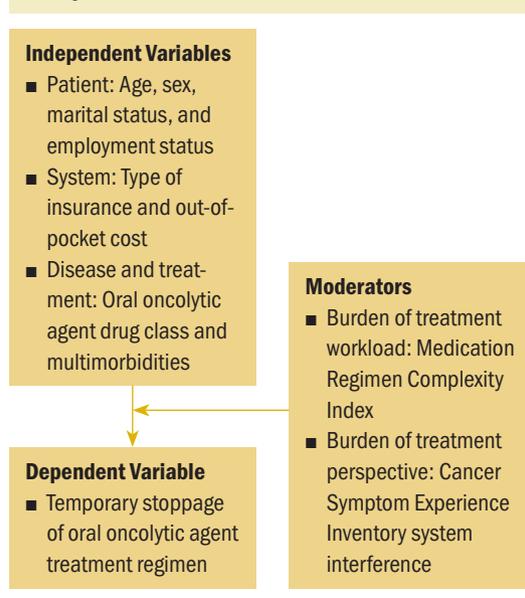
Sample and Setting

Participants in the parent study were recruited from six National Cancer Institute–designated cancer centers across the Midwest and Eastern United States (University of Michigan, Indiana University,

Ohio State University, University of Pittsburgh, Northwestern University, and Yale University). The institutional review boards at Michigan State University and all recruitment sites approved the parent study. Patients agreed to enroll by signing a consent form and could withdraw from the study at any point. Inclusion criteria for the parent study were being aged 21 years or older, able to speak English, were newly prescribed one of the designated OOAs (U.S. Food and Drug Administration-approved), have an Eastern Cooperative Oncology Group performance score of 0–2 or Karnofsky score of 50 or greater (Karnofsky & Burchenal, 1949; Oken et al., 1982), and actively receiving cancer treatment from one of the participating cancer centers. Patients were excluded if they had difficulty hearing on the telephone, limited or no access to a touch-tone phone, cognitive deficits as determined by recruiters, or were receiving hospice care. The parent study sample size was calculated with a power of 0.8, with a total of 272 patients consenting to participate in the parent trial. All 272 participants who completed the baseline interview were included in this secondary data analysis with no missing data for included variables.

Data Collection

Data were collected via telephone by trained interviewers at baseline and 4, 8, and 12 weeks. Data collected included OOA prescription information and pill

FIGURE 1. Burden of Treatment Moderation Analysis Model

Independent Variables
- Patient: Age, sex, marital status, and employment status
- System: Type of insurance and out-of-pocket cost
- Disease and treatment: Oral oncolytic agent drug class and multimorbidities

Moderators
- Burden of treatment workload: Medication Regimen Complexity Index
- Burden of treatment perspective: Cancer Symptom Experience Inventory system interference

Dependent Variable
- Temporary stoppage of oral oncolytic agent treatment regimen

counts, demographics, insurance coverage, social support, symptoms, multimorbidities, and interactions with healthcare providers. Data were also collected during the experimental group's daily reminder calls and participants' automated weekly symptom calls. After participants completed the study, trained abstractors at the respective cancer centers completed medical record audits. Quality assurance checks were completed on each medical record audit as well as randomly selected interviews.

Measures

Participant variables included age, sex, marital status, and employment status. Healthcare system variables included the type of insurance (government versus private) and presence of an OOA out-of-pocket cost at baseline. Disease and treatment characteristics included OOA drug class and the number of multimorbidities requiring medication management. Multimorbidities were based on preexisting (before the study period) prescriptions for medications primarily used to treat the specific conditions, which was found in the medical record. Two nurses on the research team reviewed the multimorbid conditions and medications. Trial group (experimental versus control) was also included as a variable.

BOT indicator variables were used for both participant workload and perspective. Participant workload was captured through OOA regimen complexity scores, which were measured using an adapted version of the Medication Regimen Complexity Index (MRCI) (George, Phun, Bailey, Kong, & Stewart, 2004). The MRCI uses variables that are weighted based on how each variable contributes to the overall complexity of a patient's medication regimen. The MRCI was tested by an expert panel for validity and inter-rater reliability (> 0.9) in patients with chronic obstructive pulmonary disease. A higher score indicates a more complex medication regimen. The adapted MRCI included all of the original MRCI variables plus a variable that added 1 point if participants were receiving concurrent IV chemotherapy. The indicator BOT patient perspective variable was baseline symptom interference. The Cancer Symptom Experience Inventory (CSEI) measured symptom interference, which contains reports on 18 symptoms commonly associated with OOAs (Given et al., 2008). The CSEI has been tested in individuals with cancer for validity and internal consistency reliability, with a Cronbach alpha of 0.8). The 0–9 interference scores for each of the 18 symptoms were summed (range = 0–162), with higher score indicating greater interference with daily activities. Symptom interference was included instead of symptom severity because it better captures patient perspectives of how symptoms influence daily living.

The outcome variable is whether or not participants experienced a temporary stoppage of their OOA

TABLE 1. Sample Characteristics (N = 272)		
Characteristic	**n**	**%**
Sex		
Male	136	50
Female	136	50
Race		
African American	22	8
Caucasian	241	89
Other/unknown	9	3
Level of education		
High school or less	71	26
Some college or completed college	150	55
Graduate or professional degree	49	18
Unknown	2	1
Employment status		
Employed	88	32
Unemployed	184	68
Marital status		
Married	167	61
Not married	105	39
Insurance type		
Government	154	57
Commercial/private	118	43
Oral agent copay		
Yes	143	53
No	114	42
Do not know	15	5
Drug category		
Cytotoxic agent	95	35
Kinase inhibitor	127	47
Sex hormone inhibitor	27	10
Other	23	8
IV chemotherapy at baseline		
Yes	73	27
No	199	73
Temporary treatment interruption		
Yes	99	36
No	173	64

regimen during the parent trial (12 weeks). Temporary stoppages were defined as any interruption in the OOA regimen with which they later continued back on the regimen. Stoppage data were collected at each recruitment site through detailed prescribing information and modifications of patients' cancer treatment regimens through the electronic health record.

Data Analysis

Descriptive statistics were used to measure baseline characteristics and the frequency of OOA temporary stoppages. Effect coding was used for the categorical predictor variables within the models. To standardize continuous variables, the group means for regimen complexity, symptom interference, and number of multimorbid conditions were subtracted from each patient's value.

For the primary research question, a moderation analysis was implemented using two multiple logistic regression models, based on Baron and Kenny (1986). Figure 1 provides an illustration of the moderation analysis model with all included variables. The outcome for both models was whether an individual experienced a temporary stoppage during the 12-week parent trial. Because the primary focus for this work is the burden of patients with cancer and multimorbid conditions, participants' multimorbidities were the baseline characteristic variable included in the interaction term with the BOT indicator variables (regimen complexity and symptom interference). Chi-square tests and simple logistic regressions were completed for categorical and continuous variables, respectively, to test the main effect of each predictor on the outcome of temporary stoppages. Significant main effects and the moderation variables were included in the final regression models. If the moderation interaction terms were found to be nonsignificant, then a main effects regression model including the significant predictors and three moderation variables (multimorbidity, regimen complexity, and symptom interference) would be analyzed. Included data met assumptions of statistical tests. Data were analyzed using STATA/IC, version 14.0, software.

Results

The parent trial sample of 272 was split evenly between men and women and had a mean age of 61 years (see Table 1). Thirty-two percent of the sample (n = 88) was employed either part- or full-time, and 61% (n = 167) were married at the time of their baseline interview. Fifty-seven percent (n = 154) of participants' primary insurance was government coverage, which included Medicare, Medicaid, and Veterans Affairs (VA). For their initial OOA prescription, 53% (n = 143) had an out-of-pocket cost, with a mean cost of $258. Of the 28 different primary OOAs prescribed to patients, 82% were either in the cytotoxic agent (n = 95) or kinase inhibitor (n = 127) drug classes. In addition to being prescribed an OOA, 27% of the sample (n = 73) was also receiving IV chemotherapy at baseline.

In addition to their cancer, participants had an average 3.39 chronic conditions requiring medication management (see Table 2), with an average of 12 non-cancer treatment medications per participant. The most common multimorbidities were cardiovascular disease, peptic ulcer disease, depression, diabetes, hyperlipidemia, and renal disease. Participants' mean treatment regimen complexity

TABLE 2. Sex Difference of Predictor Variables						
	Male (N = 136)		Female (N = 136)		Total (N = 272)	
Variable	$\bar{X}$	SD	$\bar{X}$	SD	$\bar{X}$	SD
Age (years)	63.1	12.34	59.67	11.89	61.38	12.22
Multimorbid conditions[a]	3.22	2.04	3.55	1.93	3.39	1.99
Cancer treatment regimen complexity[b]	6.67	2.71	6.95	2.62	6.81	2.67
Baseline symptom interference[c]	15.33	20.36	20.35	19.55	17.84	20.08
Four-week symptom interference[c]	13.46	19.73	14.81	19.09	14.14	19.39

[a] Based on preexisting medication prescribed prior to the trial, with scores ranging from 0 to 9.
[b] Based on the Medication Regimen Complexity Index, with scores ranging from 1 (low complexity) to 16 (high complexity).
[c] Based on a symptom experience subscale, with scores ranging from 0 (no interference) to 162 (total interference).

score was 6.81 (SD = 2.67, range = 1–16). Participants had a mean baseline symptom interference score of 17.84 (SD = 20.08, range = 0–119). During the course of the 12-week parent trial, 36% (n = 99) experienced at least one temporary stoppage of their cancer treatment regimen. Table 3 shows the frequency of temporary interruptions by characteristics.

For the final moderation regression models, chi-square tests showed that sex and OOA drug class had significant group differences in terms of temporary stoppages. Women were more likely to experience a temporary stoppage during the course of the trial (p < 0.001). After testing OOA drug class using logistic regression with effect coding, those prescribed cytotoxic agents (p = 0.049) and kinase inhibitors (p = 0.004) experienced a greater number of temporary stoppages than those taking sex hormone inhibitors and other OOAs. Age, marital status, employment status, type of insurance, out-of-pocket cost, and experimental/control group showed no significant differences of temporary stoppages and, therefore, were not included in the final moderation regression models.

Both of the interaction terms between symptom interference and multimorbidity and OOA regimen complexity and multimorbidity were nonsignificant within their respective models. Therefore, a regression model was conducted that included sex, OOA drug class, symptom interference, regimen complexity, and multimorbidity (see Table 4). Much like the interaction terms, the main effects for the BOT variables were nonsignificant. However, like the moderation models, sex and OOA drug class were significant. Women (p = 0.018) and participants prescribed kinase inhibitors (p = 0.004) were more likely to experience a temporary stoppage during the parent trial. However, cytotoxic agents were no longer statistically significant.

Discussion

Patients with cancer are continuing to live longer as cancer treatments have become more effective. Consequently, this longer survival time increases the chances that a patient with cancer will have other chronic conditions that require medical management (Sarfati et al., 2016). With the population of patients with cancer and multimorbid conditions rising, it is important to understand the BOT these individuals face while managing their cancer and multimorbid conditions (Sarfati et al., 2016; Williams et al., 2016). This study is the first to examine the BOT of patients prescribed OOAs who must also medically manage other multimorbid conditions. Similar to previous cancer-related BOT studies (Cheng & Levy, 2017; Henry et al., 2008; Presley et al., 2017), this current analysis used indicator variables to measure BOT components. However, unlike previous studies, this analysis included an indicator variable for patient perspective (patient-reported symptom interference) as well as an indicator variable for patient workload (cancer treatment regimen complexity).

OOAs are a last line of treatment for most patients with cancer, and patients could theoretically be taking

TABLE 3. Frequency of Temporary Interruptions by Baseline Characteristic

	Temporary Interruption			
	Yes (N = 99)		No (N = 173)	
Characteristic	n	%	n	%
Sex				
Male	34	25	102	75
Female	65	48	71	52
Age (years)				
Younger than 65	57	36	100	64
65 and older	42	37	73	63
Marital status				
Married	60	36	107	64
Not married	39	37	66	63
Employment status				
Employed	33	38	55	62
Not employed	66	36	118	64
Multimorbidities				
0	4	18	17	81
1–3	46	36	81	64
4 or more	49	40	75	60
Drug class				
Cytotoxic agent	35	37	60	63
Kinase inhibitor	55	43	72	57
Sex hormone inhibitor	1	4	26	96
Others	8	35	15	65
Insurance type				
Government	61	40	93	60
Private	38	32	80	68
OOA copay				
Yes	51	36	92	64
No	41	36	73	64
Not sure	7	47	8	53

OOA—oral oncolytic agent
Note. Because of rounding, percentages may not total 100.

them until the end of life (Kawakami et al., 2015; Winn et al., 2016). Symptom burden is a primary concern for oncology providers in the management of OOAs—increased symptom burden is a primary reason for patients needing temporary stoppages or dose changes with their OOA regimens (Hall et al., 2016). Symptoms were the most common reason for temporary stoppages in the parent trial. Of the 99 participants who experienced a temporary stoppage, the most common symptoms and toxicities associated with temporary stoppages were fatigue, anemia, abnormal blood counts, cold or flu-like symptoms, nausea and vomiting, skin rash, and hand-foot syndrome. In addition, about 25% of the sample experienced a permanent stoppage of their treatment regimen (Sikorskii et al., 2017). Permanent stoppages are primarily driven by disease progression and, therefore, patients do not have as much say in the decision as they do with temporary stoppages (Lo et al., 2015).

The results of the initial group difference analysis indicate women and those prescribed kinase inhibitors and cytotoxic agents were more likely to experience a temporary stoppage of their cancer treatment regimen. The two moderation regression models showed similar results. However, when factoring in sex, multimorbidity, treatment regimen complexity, and baseline symptom interference, cytotoxic agents no longer had a significant difference in terms of temporary stoppages, whereas kinase inhibitors remained significant. Given the different symptom profiles associated with certain OOAs, differences in temporary stoppages among OOA drug classes was expected (Cornelison, Jabbour, & Welch, 2012; Dasanu, 2012). The most commonly prescribed kinase inhibitors in the parent trial were palbociclib, pazopanib, sorafenib, and regorafenib.

To explore the significant influence of sex on temporary interruption, additional analyses were completed examining the differences between men and women. Although women had a significantly higher mean symptom interference score at baseline (p = 0.038), there was no difference in symptom interference between men and women after taking their OOAs for four weeks. With symptoms being the primary driver behind temporary stoppages, it is unclear why women experienced a significantly higher number of temporary interruptions than men in the parent trial. This could possibly be related to women taking OOAs that had higher proportions of temporary stoppages. Future research will be needed to examine sex differences related to OOA regimen modifications.

The results of the moderation regression analyses showed no significant affect on temporary stoppages within the two models resulting from the main effects of cancer treatment regimen complexity (patient workload), baseline symptom interference (patient perspective), multimorbidity, and their interaction terms. This was not an expected finding because the literature has described the impact of multimorbidities on the management of cancer treatment and overall quality of life of patients with cancer (Sarfati et al., 2016; Søgaard, Thomsen, Bossen, Sørensen, & Nørgaard, 2013; Tawfik et al., 2016; van Leersum et al., 2013; Williams et al., 2016). The reason for lack of significant findings could be related to the measurement of multimorbidities, which was operationalized based on non-cancer prescription medications within patients' medical record audit. The same could be said for the use of BOT indicator variables as opposed to a BOT-specific measure. Although not statistically significant, patients with multimorbid conditions had a higher frequency of temporary stoppages than patients with no multimorbidities. Given this, more research is needed to examine the impact of multimorbid conditions on the OOA regimen modifications and patient symptom burden.

Limitations

Using indicator variables for the BOT components was a limitation of this secondary analysis. Other measures for patient workload and perspective, such as a validated BOT scale, may have yielded different results within the study sample. Inclusion of ICD-10 diagnoses within the parent trial may have improved the

TABLE 4. Predictor Variable Main Effects on Temporary Stoppages				
Variable	B	SE	OR	p
Multimorbidity	0.035	0.07	1.036	0.604
Symptom interference	0.003	0.01	1.003	0.695
Regimen complexity	0.09	0.06	1.094	0.125
Sex				
Male	–0.329	0.14	0.719	0.018
Female (ref)	–	–	–	–
Drug class				
Cytotoxic agent	0.495	0.33	1.641	0.135
Kinase inhibitor	0.98	0.34	2.667	0.004
Others	0.456	0.44	1.578	0.296
Sex hormone inhibitor (ref)	–	–	–	–
OR—odds ratio; ref—referent; SE—standard error				

measurement of multimorbidities. The sample lacked racial diversity and was highly educated, and, therefore, was not representative of the general U.S. population. Finally, the follow-up period of the parent trial was 12 weeks. A longer follow-up time may have shown different results as patients' cancer treatments progressed.

Implications for Research and Practice

OOAs provide a sense of convenience for patients with cancer, unlike traditional IV chemotherapy. However, with that convenience comes an increased responsibility to manage their cancer treatment and side effects. Oncology nurses are at the forefront to address the challenges for patients being prescribed OOAs for the first time. This study showed that certain patient groups are more susceptible to experiencing temporary stoppages of their OOA regimens. These stoppages can be the result of a number of reasons. One of the most common reasons is related to severe symptoms and side effects (Sikorskii et al., 2017). Patients with cancer are required to do a great deal of the symptom management at home with less frequent interaction with their oncologist and nurses than those receiving IV chemotherapy. Oncology nurses need to emphasize the importance of patients proactively seeking out care to properly manage their OOAs and effectively manage symptoms. Increased intervention by oncology nurses through closer monitoring and individualized education plans may help patients better self-manage symptoms.

With the current rise in the prevalence of individuals with cancer and multimorbid conditions, the research is far behind the pace needed to meet the challenges facing this population. BOT is a vital concept to answering the question of why these individuals have difficulties in managing the challenges going on in their lives. This study is an initial step to start to answer that question. Future research will need to include BOT measurement development, pilot studies, and eventually RCTs to address and target the BOT experienced by this population. This secondary analysis discusses some of the difficulties experienced by patients in managing OOAs along with other diseases. Future work will need to further examine BOT and develop interventions that can be translated to practice for oncology teams to provide strategies to patients who are struggling to manage their cancer and other conditions.

Conclusion

The current study found that 36% of patients experienced a temporary stoppage in their cancer treatment regimen during the course of 12 weeks. With a short observation period, this shows the volatility of cancer treatment for those prescribed OOAs. Women and patients prescribed kinase inhibitors were more likely to experience temporary stoppages than men and patients prescribed other OOA classes, respectively. These patients are in a difficult period of their cancer care trajectory—most have failed prior lines of treatment. If these patients have other chronic conditions as well, the complexity of management and level of burden is increased. As the population lives longer, patients with cancer and multimorbid conditions will become a norm. Continued research efforts within this population will be vital for practice guidelines and empowering patients to effectively self-manage their OOAs and multimorbid conditions in the home.

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