Multidisciplinary Cancer Care Model

A positive association between oncology nurse navigation and improved outcomes for patients with cancer

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BACKGROUND: Patients with cancer often experience prominent deficiencies in cancer care in the immediate period following initial cancer diagnosis.

OBJECTIVES: This article aims to determine whether the inclusion of a gastrointestinal (GI) oncology nurse navigator (ONN) on the multidisciplinary cancer care team is associated with improved quality of care for patients.

METHODS: This retrospective study compared randomly selected patients with GI cancer with and without an ONN. Two endpoints, the time from diagnosis to treatment and the average number of missed appointments, were evaluated through a review of healthcare records using the Epic electronic health records system.

FINDINGS: Patients with an ONN had a shorter time lapse between diagnosis and treatment commencement (p < 0.001). In this group, the average time spent between initial diagnosis and the start of treatment was 15.15 days, compared to 42.93 days for patients who were not part of the multidisciplinary cancer care model.

QUANTITATIVE EVIDENCE CONCERNING THE QUALITY of cancer care that patients receive has been in demand. Several publications (Ayanian et al., 2005; Wagner et al., 2014) have called attention to deficiencies in the cancer care experiences of patients. A study by Ayanian et al. (2005) involved a survey of patients with colorectal cancer and their results indicated that 28%–47% of patients reported difficulties in receiving information, accessing psychological support, and receiving care coordination throughout the course of their treatment. In addition, a randomized, controlled trial by Wagner et al. (2014) identified the following three major challenges faced by patients with cancer and their caregivers: (a) delays in and a lack of coordination of care; (b) a lack of information relevant to the patients’ diagnoses; and (c) inadequate attention to patients’ emotional and social problems. This trial reported that these challenges particularly arise in the immediate period following the cancer diagnosis.

Background
As a result of the challenges faced by patients after their initial diagnosis, many cancer care organizations have incorporated the role of the oncology nurse navigator (ONN) as a pivotal part of their multidisciplinary cancer care models. ONNs assist in the coordination of care, provide disease-specific education to patients and family caregivers, and ensure patient adherence to treatment (Blaseg, Daugherty, and Gamblin, 2014). A study by Blaseg et al. (2014) demonstrated that oncology nurse navigation has the potential to improve outcomes for patients with cancer throughout the continuum of care by decreasing the time from diagnosis to treatment. Functioning as part of the multidisciplinary cancer care team, ONNs ensure timely access to and delivery of patient-centered care. In addition, ONNs frequently serve as the primary contact person for patients seeking assistance with understanding the healthcare system, as well as play a role in preventive cancer screening and care coordination (Doerrler-Evans, 2016).

When dealing with the complexities of cancer care, which often requires multiple subspecialties to work in a coordinated fashion, the addition of an ONN as a coordinator of care has been proven to enhance the overall quality of care for patients faced with a cancer diagnosis (Wagner et al., 2014).
However, according to Wagner et al. (2014), in-depth research on the effectiveness of ONN programs has not been conducted, despite the increasing number of programs and the establishment of a national society for navigators called the Academy of Oncology Nurse and Patient Navigators. Although preliminary research is limited, the ONN role continues to develop based on evidence-based nursing practice and research.

As the second most frequent cancer diagnosis in the United States, gastrointestinal (GI) cancers are responsible for 25% of all cancer-related deaths (American Cancer Society [ACS], 2018). Based on the evidence, the Community Medical Centers in Fresno, California, established an ONN program as an essential part of the multidisciplinary cancer care model for patients with GI cancer. The role continues to evolve at this institution, with ONNs working within the multidisciplinary team to streamline and to facilitate cancer care. The purpose of this retrospective study was to determine whether incorporating the ONN role into the multidisciplinary cancer care model improved outcomes for patients with a complex GI cancer diagnosis. In addition, the study aimed to improve the overall time from initial diagnosis to treatment, as well as to decrease the average number of missed appointments.

**Literature Review**

Since the emergence of the ONN role in the 1990s, evidence regarding how to develop an effective cancer care model for ONNs has been limited. Many pilot programs were developed without evidence-based guidance, which created a need for additional research related to this topic. A study by Horner et al. (2013) documented the complexity of delivering cancer care when multiple clinical specialties are involved and treatment protocols based on innovative research are rapidly evolving. According to Horner et al. (2013), because of undefined accountability during the early period of cancer care before the start of treatment, the complexities of cancer care are further exacerbated. From these gaps in cancer care and their effects on patients’ treatment plans, the ONN role was developed with the primary objective of managing care for patients recently diagnosed with cancer. Horner et al. (2013) believed that having an experienced ONN on the multidisciplinary care team can eliminate unclear or unmet expectations for patents throughout the cancer trajectory.

A study conducted by May, Woldhuis, Taylor, and McCahill (2014) highlighted how the role of navigation has evolved since its advent in the 1990s when underserved patients with breast cancer were the focus of care. May et al. (2014) identified the role, quality indicators, and the process of navigation for patients with GI cancer throughout the continuum. An identified barrier to the development of oncology nurse navigation programs was the challenge of recognizing core metrics for data collection. An inconsistency of specific metrics being tracked across programs was observed, as well as time constraints related to collecting reliable data while also providing optimal patient care (May et al., 2014). Overall, ONNs serve as a bridge of communication between patients and healthcare providers, as well as manage the complexity of the clinical diagnosis. Oncology nurse navigation now includes scheduling diagnostic testing, providing education specific to the patient’s diagnosis, providing social support resources and referrals, managing symptoms, and maintaining patient adherence to treatment (May et al., 2014).

Patients with GI cancer require an extensive workup prior to the development and initiation of a definitive treatment plan. According to May et al. (2014), most patients with pancreatic cancer required multiple consultations prior to referral for evaluation. Because of this, treatment for patients with GI cancer was significantly delayed after diagnosis, with some patients waiting months or longer to start treatment. In addition, it is important for ONNs to be knowledgeable about cancer staging complexities and to have established relationships with key members of various hospital departments to ensure that testing and procedures for patients are expedited (May et al., 2014). The study also had a goal of minimizing the days between diagnosis and treatment, which was met 75% of the time. May et al. (2014) reported that limitations affecting their study included a lack of prior research to identify definitive roles for the ONN, an absence of baseline metrics, and a lack of cost analysis to determine the financial impact of oncology nurse navigation.

A study by Pennell, Das, Clauser, Petrelli, and Salner (2010) indicated that the creation of a multidisciplinary cancer care model enhances the information exchange among the patient, physicians, and support staff. Most notable is that tumor board reviews have evolved into prospective multidisciplinary treatment planning conferences. It is the responsibility of the ONN to document the consensus recommendations from the board.

“Through the early assessment of patient needs, oncology nurse navigators provide continuity of care and care coordination, which leads to better patient advocacy.”
and then relay the treatment care plan to the patient, family caregivers, primary care physician, and additional members of the healthcare team. Multidisciplinary care teams are described as collaborative, consultative, productive, and focused (Fennell et al., 2010). As of 2016, the Commission on Cancer requires a minimum of 80% of the cases presented to tumor boards to be prospective (Commission on Cancer, 2015). In this format, patient cases are presented at the time of diagnosis and again at critical points throughout the cancer trajectory to close the communication loop (Fennell et al., 2010).

The effects of ONNs on the health outcomes of patients with cancer was explored in a study by Lee et al. (2011). Seventy-eight patients were studied to determine the effectiveness of ONN interventions for newly diagnosed patients with cancer. Outcomes measured in this study were quality of life, patient satisfaction, and length of stay. Multiple patients elected to transfer to different hospitals because of unsatisfactory care and a lack of education on treatment protocols in one hospital (Lee et al., 2011).

In Lee et al. (2011), 53 of 78 patients received care coordination from ONNs. Interventions in the experimental group included treatment plan education for the patients and their families, arrangement of diagnostic studies prescribed by physicians, referrals to support services, communication among the multidisciplinary service lines, resource coordination for practical and financial concerns, and monitoring of patient progress throughout the cancer continuum. The results of the study indicated that ONNs improved clinical outcomes by enhancing access to care, providing more timely care, and increasing communication among the patients, their families, and the healthcare team (Lee et al., 2011).

**Methods**

This retrospective study evaluated the multidisciplinary cancer care model established at the Community Medical Centers at two endpoints: (a) the time from diagnosis to initiation of treatment and (b) the average number of missed appointments. Initial staging and workup after the initial cancer diagnosis can be a lengthy process, resulting in significant treatment delays. This study measured the time that elapsed between the patient’s initial diagnosis to initiation of treatment as a measure of quality. In addition, missed appointments were measured as an indicator of care coordination effectiveness and treatment compliance.

Based on the evidence, which identified the importance of multidisciplinary tumor board review presentation and the time between diagnosis and treatment initiation, a weekly treatment planning conference and a multidisciplinary clinic were arranged by the ONN. The multidisciplinary clinic included the medical oncologist, ONN, registered dietitian, and social worker. The authors measured the effectiveness of including an ONN in the multidisciplinary cancer care model and focused on the following four endpoints: (a) days until the ONN contacts the patient (goal of 80% contacted within two business days of referral), (b) days until cancer staging is completed (goal of 80% to have completed cancer staging within five business days of referral), (c) days until patient is evaluated in the GI multidisciplinary clinic (goal of 90% evaluated within 10 calendar days of referral), and (d) days to cancer treatment initiation (goal of 70% to start cancer therapy within 22 calendar days of referral). Scheduling availability affected cancer staging through delays in appointments for imaging or endoscopy procedures and treatment initiation. The GI multidisciplinary clinic evaluated 413 patients referred to the ONN program from January 2010 to August 2012.

**Setting and Population**

This study was conducted in Fresno County in California and addressed the diverse population of patients with GI cancer within the Community Medical Centers Healthcare Network, which includes the Community Regional Medical Center and the Clovis Community Medical Center. According to ACS (2017), Fresno County had about 3,406 new cancer cases in 2014. Each year, Community Medical Centers treats approximately 2,100 new cancer cases. The target population included patients with GI cancer being treated at the Community Medical Centers. Resources used included Community Medical Centers electronic health record (EHR) system and statistical data provided by the cancer registry department.

**Data Collection**

After institutional review board approval was obtained, the records for all patients with GI cancer were identified using the Epic EHR system. Patients with cancer meeting the study criteria were randomly selected to be part of the retrospective study using data from the Community Medical Centers’ cancer registry. These patient records were divided into patients who were assigned to an ONN as a part of the multidisciplinary cancer care model and patients who did not have an ONN assigned to them. At this institution, no systematic approach is in place for patient assignment to an the oncology nurse navigation program, which relies solely on provider preference for initiation. Sixty patients from each group were randomly selected by the EHR’s computer randomization capabilities. Once patients were identified, pertinent data were extracted from the EHR for evaluation and use in this study, including age and sex. Data were evaluated from 2014–2016 for patients with GI cancer aged older than 18 years who were treated at the Community Medical Centers. The differences between the two cohorts, evaluating time elapsed between diagnosis to treatment initiation and the number of missed appointments, were assessed for each patient record.

**Analysis**

Comparison of medians was performed using the Wilcoxon rank sum test, and proportions were evaluated using Pearson’s
chi-square test or Fisher’s exact test. A paired t test was used for continuous variables and chi-square or Fisher’s exact test was used for categorical variables. STATA, version 13.0, software was used to analyze the data set. In the two-tailed test, statistical significance was set at \( p < 0.05 \). Power analysis revealed that at least 60 patients are required in each arm to achieve power of 80% with an alpha of 0.05.

**Results**

The experimental group included patients assigned to an ONN and was comprised of 34 men and 26 women. Patient ages ranged from 35–88 years, with an average age of 60.61 and a median of 60.5. The control group of patients not assigned to an ONN consisted of 35 men and 25 women. The control group ages ranged from 31–92 years, with an average age of 67.15 and a median of 68. No statistical significance between the age and sex variables in these groups was found.

Patients who were enrolled in the ONN program as a part of the GI multidisciplinary cancer care model experienced a significantly shorter time lapse between the diagnosis and treatment commencement points (\( p < 0.001 \)) than those patients who were not assigned to an ONN. Statistical analysis revealed no difference in missed appointment rates between the two groups (\( p = 0.7 \)). Averages measured throughout the study period are presented in Table 1.

**Discussion**

The findings indicated that including an ONN in the GI multidisciplinary cancer care model significantly reduced the timeframe from diagnosis to treatment. Although the two groups studied revealed no difference in missed appointment rates, this lack of statistical significance can be attributed to the patients’ dedication to their course of treatment following their cancer diagnosis. However, although patients in both groups were diligent in receiving care, the findings indicated that, without the addition of an ONN, the required cancer staging and workup was not expedited, resulting in additional follow-up appointments and delayed diagnostic examinations. These treatment delays subsequently lead to an increase in the time from diagnosis to treatment, as evidenced by the 28-day difference for the patients who were not assigned to an ONN.

Treatment delays in cancer care have the potential for devastating outcomes for patients and their loved ones. Through the early assessment of patient needs, ONNs provide continuity of care and care coordination, which leads to better patient advocacy and improved outcomes for patients with cancer (Skrutkowski et al., 2008). In addition, research has indicated that patients who are presented to a specialized multidisciplinary tumor board review tend to have better outcomes than those who are not (Fennell et al., 2010). Of the patients assigned to an ONN in this study, 100% were presented in a multidisciplinary prospective fashion at the weekly planning conferences established by the Community Medical Centers.

**Limitations**

This study is limited with the inherent shortcomings of any retrospective study. Multiple patient characteristics were present that could have independently affected the final results, such as the patients’ socioeconomic status and the availability of resources. In addition, the patients’ medical status and any existing comorbidities are other independent variables with the potential to influence outcomes.

A potential bias within this study could be that it was the multidisciplinary cancer care model as a whole and not an individual ONN that affected the outcome of time from diagnosis to the start of treatment. In addition, as stated previously, all of the patients in the multidisciplinary cancer care model were presented at a multidisciplinary tumor board, which may have influenced the study results.

**Implications for Nursing**

Evolving healthcare systems have shifted toward a more patient-centered approach to care. Historically, nurses have sought to form patient–nurse relationships where a partnership is developed. Throughout the cancer continuum, oncology nurses provide care and support to patients (Komatsu & Yagasaki, 2014). This study emphasizes the overall role of ONNs, delineating the fact that the ONN role is a pivotal part of the multidisciplinary cancer care model for patients and plays a significant role in improving patient outcomes. In addition, this study can serve as a pilot program to pave the way for future randomized clinical trials to better delineate the effects of multidisciplinary cancer care models and oncology nurse navigation in improving the patient experience following diagnosis of and treatment for cancer.

**Table 1.**

<table>
<thead>
<tr>
<th>CHARACTERISTIC</th>
<th>ONN (N = 60)</th>
<th>NON-ONN (N = 60)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sex</td>
<td>n</td>
<td>n</td>
</tr>
<tr>
<td>Male</td>
<td>34</td>
<td>35</td>
</tr>
<tr>
<td>Female</td>
<td>26</td>
<td>25</td>
</tr>
<tr>
<td>Missed appointments</td>
<td>9.6</td>
<td>9.02</td>
</tr>
<tr>
<td>Days from diagnosis to treatment</td>
<td>15.15</td>
<td>42.93</td>
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<td>ONN—oncology nurse navigator</td>
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Conclusion
This retrospective study reviewed the efficacy of a multidisciplinary care model, with an emphasis on oncolgy nurse navigation programs that could lead to improved outcomes for patients with cancer. According to Fiscella et al. (2012), evidence-based research on the impact of oncology nurse navigation for patients with cancer is limited. An area for additional research is the potential financial benefits of oncology nurse navigation programs on hospital systems. Assessment of the return investment as a result of fewer emergency department visits, shorter length of stays, and improved resource usage may potentially increase the development of quality oncology nursing navigation programs.

Based on the results of this study, expanding and empowering the ONN role can further improve the quality of care provided by the GI multidisciplinary cancer care team. The model described in this article can be implemented at other institutions to facilitate the referral of newly diagnosed patients with GI cancer to ONNs and to provide better outcomes for patients. For example, an advanced oncology nurse practitioner has the ability to guide patients through their treatment care plan while also eliminating the need for multiple unplanned visits, such as emergency department visits for routine oncology health maintenance, therefore conserving valuable hospital resources. Overall, past and current research confirms that complex disease processes require expert, multidisciplinary, and holistic care for patients and families faced with a cancer diagnosis.

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The authors take full responsibility for this content. Chaudhary has previously served on speakers bureaus for Novartis Pharmaceuticals. The article has been reviewed by independent peer reviewers to ensure that it is objective and free from bias.

REFERENCES

IMPLICATIONS FOR PRACTICE
- Incorporate an oncology nurse navigator on the multidisciplinary cancer care team to facilitate interdisciplinary collaboration.
- Improve outcomes for patients with cancer by expediting initial workup and cancer staging.
- Provide patient-centered care for vulnerable populations, such as individuals with gastrointestinal cancer, to ensure better patient outcomes.