

## QUALITY IMPROVEMENT

# Improving Depression Screening in Adult Patients With Cancer

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Authors' disclosures of conflicts of interest are found at the end of this article.

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## Abstract

Depression in adult patients with cancer may lead to decreased treatment adherence, decreased quality of life, and possible suicidal ideation. Adequate screening can promote timely diagnosis and treatment of depression. A quality improvement project was implemented at a cancer center in which adult patients are diagnosed with and treated for cancer. A paper version of the 9-item Patient Health Questionnaire (PHQ-9), a validated tool to screen for depression, was provided to patients during their scheduled appointment. A two-sample test of proportions was used to compare the proportion of patients screened before project implementation to the proportion of patients screened after project implementation. Depression screening rates increased from 2% before to 12% after project implementation. Frequent screening with the PHQ-9 should occur in adult patients with cancer to adequately identify depressive symptoms. Adequate screening will provide the necessary information for providers to make referrals to mental health services and allow patients to adhere to their treatment plans, improving their quality of life.

A recent literature review in the *Clinical Journal of Oncology Nursing* noted that depression rates in patients with cancer can be as high as 60% in some settings (Decker & Tofthagen, 2021). Comorbid depression among patients with cancer contributes to worsening cancer prognosis and poorer overall health (Bortolato et al., 2017; Decker & Tofthagen, 2021). Additionally, adult patients with comorbid cancer and depression have decreased treatment

adherence and poorer health outcomes than their counterparts diagnosed with cancer alone (Bortolato et al., 2017). Furthermore, physiologically, depression has been linked to processes such as inflammation, which could promote tumor progression (Bortolato et al., 2017). Given the relatively high prevalence of depression among patients with cancer, it is important to address emotional and psychological factors affecting patients with cancer (Decker & Tofthagen, 2021; Pilevarzadeh et al., 2019).

Underdiagnosed and undertreated depression among patients with cancer may lead to several risk factors threatening their quality of life, such as suicidal ideation (Decker & Tofthagen, 2021).

At an outpatient cancer center, between July 2022 and October 2022, only 244 PHQ-9 depression screenings were completed. The average number of patient visits per day was around 105. Prior to implementing the project, the patients were asked if they had symptoms of depression, rather than asked the first two questions (“Over the last 2 weeks, how often have you been bothered by any of the following problems? Question 1: Little interest or pleasure in doing things. Question 2: Feeling down, depressed, or hopeless) of the 9-item Patient Health Questionnaire (PHQ-9). The patient would be given a PHQ-9 score “range” in the electronic medical record (EMR) based on the answer to the verbal question if they felt depressed. The patients were not routinely answering all nine questions of the PHQ-9.

Several methods exist to screen for depression. Traditionally, depression screening has included the administration of the 2-item Patient Health Questionnaire (PHQ-2) followed by the PHQ-9 (Kroenke et al., 2003; Kroenke et al., 2001). The PHQ-2 may be administered verbally, followed by either verbal or written administration of the PHQ-9 to further determine the severity of depression (Kroenke et al., 2001). The PHQ-9 is a brief, simple, and easy to administer tool for depression screening (Degefa et al., 2020). It is a reliable and valid tool for measuring a major depressive episode (MDE) in patients with chronic conditions such as cancer showing good internal consistency (Cronbach's  $\alpha = .78$ ) and criterion validity. The PHQ-9 has shown varying levels of sensitivity and specificity for screening for MDE (Dajpratham et al., 2020; Degefa et al., 2020; Levis et al., 2019, 2020; Negeri et al., 2021; Rancans et al., 2018). Degefa and colleagues (2020) reported that the PHQ-9 has a sensitivity of 88% and a specificity of 78.1% for a cutoff point equal to or greater than four.

Routine screening can be effective in detecting depression in patients with cancer (Degefa et al., 2020; Ganz et al., 2021; Hahn et al., 2020; Pilevarzadeh et al., 2019). Standardized depression screening is important because the provision of quality care includes addressing mental health.

The development of a standardized method and frequency for depression screening in patients with cancer is vital to the quality of life (Mansour et al., 2020). Thus, the overall purpose of the quality improvement (QI) project was to implement a modified screening process to increase depression screening rates among adult patients with cancer.

## METHODS

### Context

A QI project was conducted at an outpatient cancer center with adult patients with cancer from July 17, 2023, to October 6, 2023. Inclusion criteria consisted of adult patients with cancer aged 18 years and older and the ability to read and write English. Exclusion criteria included patients who had been screened for depression in the past 2 weeks or if a provider noted the patient had a cognitive impairment of grade three or four based on the Common Terminology Criteria for Adverse Events (CTCAE) grading system developed by the National Cancer Institute (NCI) for reporting signs or symptoms arising from medical treatments such as chemotherapy (UpToDate, 2022).

### Intervention

The QI process included compiling a list of eligible patients coming to the cancer center. The staff gave eligible patients a PHQ-9 questionnaire using paper and pencil. The paper and pencil method was used to increase patient participation in depression screening, improve patient and staff understanding of the symptoms of depression, and empower patients to answer the screening questions without the pressure of verbal interrogation. In addition, it is less intimidating for the older patient population, and it has reduced the risk of data breaches (Degefa et al., 2020). Lysandrou and colleagues (2024) found that the mean scores of PHQ-9 using the self-administered method were higher than the mean scores of PHQ-9 using the interviewer-administered method.

Patients completed the PHQ-9 questionnaire and gave it to the medical assistant (MA), and the PHQ-9 score was entered into the EMR. A chart review was completed at the end of each week during the project to determine whether patients were screened for depression. The intervention included the development and use of a protocol

to guide the cancer center staff on the modified screening process. Prior to implementing the modified screening process, the PHQ-2, which includes the first two questions of the PHQ-9, were asked verbally, and no standardized procedure existed to require screening. The first step of the QI project was to educate the staff on the sensitivity, specificity, validity, and reliability of the PHQ-9 in identifying depressive symptoms. Staff were requested to provide each patient with the paper version of the PHQ-9 questionnaire after check-in for their scheduled appointment. The MA provided information and assistance if the patient required help filling out the questionnaire.

### Study of the Intervention

The outcome of the process change was evaluated using retrospective chart review. A daily list was made for the staff to screen patients meeting the criteria for screening. Weekly chart audits were completed, and a data capture form was created for tracking.

### Measures

The primary outcome of interest was the rate of depression screening. Depression was measured using the PHQ-9 questionnaire, a valid and reliable depression screening tool (Arrieta et al., 2017; Dadfar et al., 2021; Degefa et al., 2020; Dajpratham et al., 2020; Rancans et al., 2018). The PHQ-9 is a self-administered questionnaire that measures the severity of depression. The PHQ-9 score is calculated based on a patient reporting 0 (not at all), 1 (several days), 2 (more than half the days), or 3 (nearly every day) in the last 2 weeks in response to the nine items on the questionnaire. A PHQ-9 score of 0 to 4 (minimal), 5 to 9 (mild), 10 to 14 (moderate), 15 to 19 (moderately severe), or 20 to 27 (severe) is calculated based on the patient's responses (Kroenke et al., 2001). The total number of visits was measured by visit (one patient could have multiple visits within the 3-month project implementation period).

Degefa and colleagues (2020) concluded that the PHQ-9 is a reliable and valid tool for measuring a MDE in patients with chronic conditions such as cancer showing good internal consistency for the reliability of the scores (Cronbach's  $\alpha = .78$ ), a sensitivity of 88%, and a specificity of 78.1% for

a cutoff point equal or greater to four, and criterion validity. The authors also concluded that the PHQ-9 is a brief, simple, and easy to administer tool for depression screening (Degefa et al., 2020).

### Analysis

Aggregate data on the number of patients with cancer seen in the cancer center, number of patients screened using the PHQ-9, PHQ-9 scores less than 10, and PHQ-9 scores greater than 10 were collected from the EMR using a data capture form each week and compared to the same data 3 months before project implementation (Figure 1). The data were first analyzed using descriptive statistics. The outcome measured was the rate of depression screening. A chi-squared test was used to compare the proportion of patients screened for depression before project implementation to the proportion of patients screened after project implementation.

### Ethical Considerations

After being determined exempt from review (not human subjects research), by the Institutional Review Board, the modified screening process was implemented at the project site. Data protection was managed by maintaining patient confidentiality throughout the project. Completed PHQ-9 questionnaires were stored in a designated locked cabinet. All paper records were securely shredded, and all electronic data were securely stored and deleted at the end of the project.

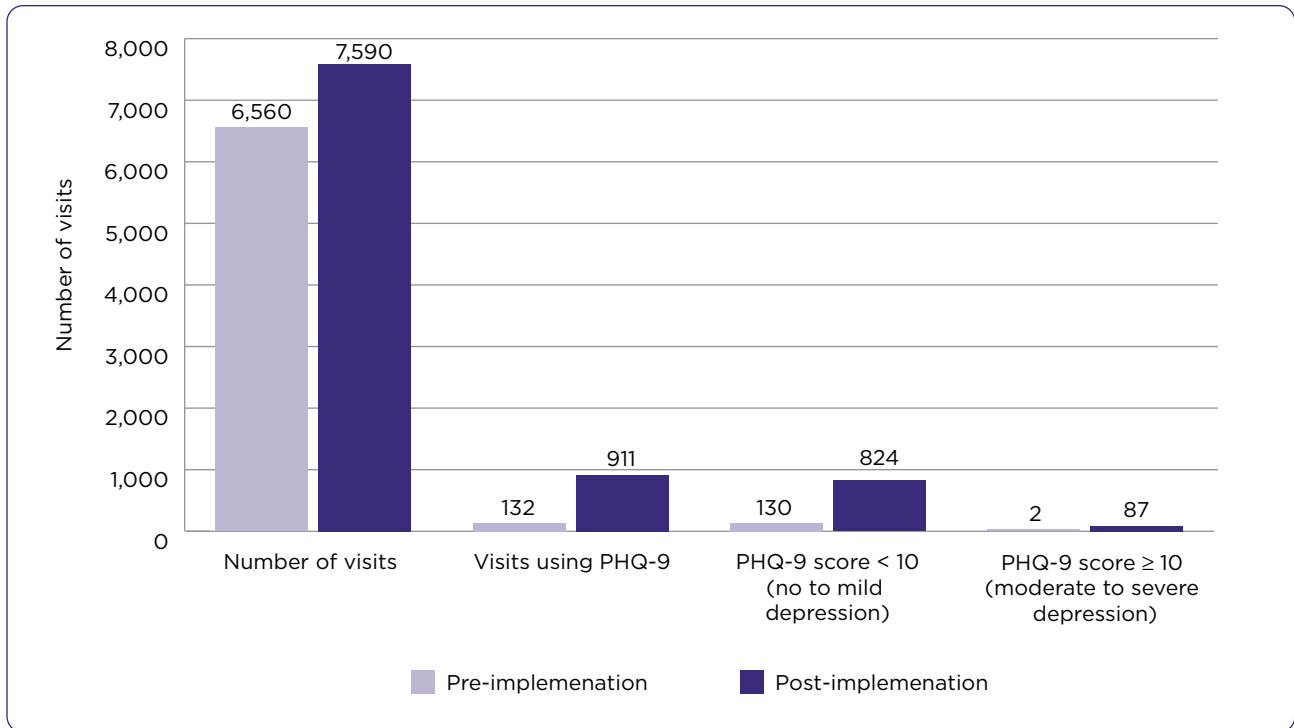
## RESULTS

### Pre-Implementation of Modified Depression Screening Protocol

In the 3-month period before the project implementation, 6,560 visits occurred in the cancer center. Depression screening occurred in 132 of the visits. A PHQ-9 score of less than 10 was documented 130 times. A PHQ-9 score of equal to or greater than 10 was documented 2 times. The proportion of visits that included depression screening before project implementation was 2%.

### Post-Implementation of Modified Depression Screening Protocol

In the 3-month period after project implementation, 7,590 visits occurred in the cancer center.



**Figure 1.** Depression screening pre- and post-implementation.

Depression screening occurred in 911 of the visits. A PHQ-9 score of less than 10 was documented 824 times. A PHQ-9 score of equal to or greater than 10 was documented 87 times. The proportion of visits that included depression screening after project implementation was 12%. Four percent of patients opted out of completing depression screening at some point during the project.

A 10 percentage point increase in proportion of visits with depression screening occurred between pre-implementation and post-implementation. A chi-squared test indicated a statistically significant relationship between depression screening rates and implementation phase (pre-implementation vs. post-implementation),  $X^2(1, N = 7,590) = 515.78, p < .0001$ .

## DISCUSSION

Appropriate depression screening that includes providing patients with a PHQ-9 questionnaire using paper and pencil can lead to the timely diagnosis and treatment of depression in adults with cancer. The paper and pencil method of PHQ-9 administration using a standardized protocol positively impacted the rate of depression screening

for adult patients with cancer. Studies have found success in modified depression screening protocols using the PHQ-9. For example, a study of the usability of the PHQ-9 in detecting depression in young breast cancer survivors concluded that depression screening can detect uncontrolled depressive symptoms (Ganz et al., 2021). Gorman and colleagues (2021) evaluated the use of an MA protocol over a physician-only screening method in a primary care setting to both increase depression screening rates and mitigate sociodemographic disparities with depression screening. A QI project conducted with pediatric patients with childhood-onset systemic lupus erythematosus increased rates of depression screening using the PHQ-9 questionnaire by implementing a standardized workflow that included pre-visit planning and the use of a dedicated QI team to carry out the intervention. Monthly depression screening rates increased to 80% and were sustained for 10 months by the end of the project (Mulvihill et al., 2021). The increased rates of depression screening and the ability to detect PHQ-9 scores greater than 10 can allow providers to order referrals for mental health services for

appropriate treatment of comorbid depression in patients with cancer.

A limitation of this project was the unavailability of EMR reports that collated the number of patients with cancer who were screened at the cancer center each day leading to time-consuming chart reviews and the potential for errors or missed screenings. Another limitation included a lack of staffing to administer and explain, then document the PHQ-9 scores. This resulted in a lower number of patients screened for depression than projected each day. Slow uptake of the intervention was a limitation that was identified as weekly chart audits revealed documentation of PHQ-2 scores rather than PHQ-9 scores. A PHQ-2 score was documented 427 times instead of a PHQ-9 score. Similarly, a study by Mitchell (2013) evaluating the success of distress screening implementation identified low acceptability for both patients and clinicians as a barrier to adequate screening for distress in patients with cancer. A total of 304 PHQ-9 scores were documented for patients with cancer visiting the cancer center.

A fourth limitation was the number of patients with cancer who refused to complete the PHQ-9 questionnaire on paper and therefore they were excluded from the project, resulting in a fewer number of cancer patients who were screened for depression after project implementation. Four percent of patients opted out of depression screening at some point during the project. The reasons for opting out were undetermined for the duration of the project; however, if the modified screening method were to be applied to additional sites in the future, modifying the frequency of screening patients for depression could help determine if a higher participation would occur.

This QI project yielded several implications for advanced practitioners. Continued use of the modified depression screening protocol is feasible at the project site because it is brief, simple, and easy to administer, making it an appropriate depression screening tool (Degefa et al., 2020). Administration of the PHQ-9 questionnaire on paper to adult patients with cancer resulted in an increased rate of depression screening; this can promote mental health referrals and identify those patients at risk for suicide with the inclusion of the ninth item of the questionnaire that

addresses any thoughts of self-harm (Kroenke et al., 2001). The process change could be sustained through the integration of an alert in the EMR to initiate depression screening at the appropriate frequency. The development of a standard operating procedure (SOP) and quarterly educational in-service materials for staff members could make the intervention more adaptable to other sites. ●

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### Disclosure

The authors have no conflicts of interest to disclose.

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