Preventative Cancer Screening Rates Among Uninsured Patients in Free Clinics: A Retrospective Cohort Study of Cancer Survivors and Non-cancer Survivors

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Abstract

Background: There is limited research on screening rates among uninsured cancer survivors. Uninsured cancer survivors are at higher risk of poorer health outcomes than the insured due to limited access to preventative screening for secondary cancers. This study examines the rates of surveillance and screening of uninsured cancer survivors and compares to uninsured patients without a cancer history seen in free clinics.

Methods: Data were collected retrospectively from electronic medical records and paper charts of patients from 10 free clinics between January 2016 and December 2018 in the Tampa Bay area. The prevalence of socioeconomic characteristics, cancer diagnoses, and screening practices were compared for cancer survivors and free clinic patients without a history of cancer. Study participants were determined to be eligible for cancer screenings based on the United States Preventive Services Task Force guidelines.

Results: Out of 13 982 uninsured patients frequenting free clinics between 2016 and 2018, 402 (2.9%) had a documented history of cancer. Out of the 285 eligible cancer survivors, 44 (15.4%) had completed age-appropriate colon cancer screening. Among the 170 female cancer survivors, 75 (44.1%) had completed breast cancer screenings, and only 5.9% (59/246) had completed cervical cancer screenings. After adjusting for age, gender, race, salary, employment status, and household size, cancer survivors were more likely to undergo colorectal cancer screening (OR: 3.59, 95% CI: 2.10–6.15) and breast cancer screening (OR: 2.13, 95% CI: 1.30–3.84) than patients without a cancer history. This difference was not seen for cervical cancer screening (OR: 0.99, 95% CI: .62–1.58).

Conclusions: Uninsured cancer survivors frequenting free clinics represent a unique population that is underrepresented in the medical literature. Our results suggest that uninsured survivors use screening services at higher rates when compared to uninsured patients without a reported cancer diagnosis. However, these rates are suboptimal when compared to national screening rates of insured cancer survivors.

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Introduction

Cancer is the second most frequent cause of death in the United States, and there were an estimated 16.9 million cancer survivors in the United States in 2019.[1] After lung cancer, breast cancer is the second most common cause of cancer death for women followed by colorectal cancer (CRC).[2] Among men, CRC is the third most common cause of cancer death following lung and prostate cancers.[1] Because of exposure to factors such as radiation therapy, diagnostic imaging, and chemotherapeutic agents, cancer survivors are at higher risk of developing second primary malignancies.[2] Approximately 15–20% of all new cancer diagnoses occur as secondary malignancies in cancer survivors.[3] The most important strategy to decrease cancer burden is screening to detect the disease early with evidence based screening guidelines. Cancer survivors, an already vulnerable population, face additional barriers to obtaining appropriate cancer screenings if uninsured. These barriers may include lack of reliable transportation to appointments, not having a primary care provider, or homelessness.[4]

Despite programs like the National Breast and Cervical Cancer Early Detection Program (NBCCEDP), cancer screening rates are lower in the uninsured and underinsured populations.[5] Consequently, underinsured patients have a higher likelihood of being diagnosed with advanced-stage solid cancers.[6] This could be because medically underserved populations tend to have fewer financial resources, less access to services, or lower health literacy.[7] As a result, uninsured cancer survivors have a greater risk of mortality due to a higher cancer burden than the general population.[8]

While both uninsured cancer survivors and uninsured patients without a cancer history have increased risk factors for cancer and face challenges for screening and early detection, there is limited published data on the utilization of free clinics for preventative or routine screening for primary or secondary malignancies in uninsured cancer survivors specifically. Free clinics may be the only access point an uninsured cancer survivor has to primary care for cancer screenings and early detection. Despite the need for regular follow-up visits and cancer screenings, 1 in 5 cancer survivors seen in community health centers remained uninsured after Medicaid expansion in states that did not expand Medicaid.[9] Given the fact that 7.7% of cancer survivors in the U.S. are uninsured, it is crucial to understand disparities that these patients are experiencing with regards to cancer screenings so appropriate interventions can be made to improve screening rates and health outcomes in this population.[10] The research that does exist on cancer screenings in uninsured patients is typically conducted at a single clinical site and does not focus specifically on uninsured cancer survivors but rather the entire free clinic population. For example, a study of one free clinic in New York found that patients seen at free clinics experience a lower cancer screening rate than their insured counterparts.[11] It is therefore important to elucidate whether there are differences in cancer screening rates between uninsured cancer survivors and uinsured patients without a history of cancer, to determine whether or not cancer survivors are at a unique disadvantage, advantage, or have no difference in cancer screenings. Furthermore, our study compares the use of screening services for CRC, breast, and cervical cancer in uninsured cancer survivors in 10 free clinics in the Tampa Bay area of Florida (a state that did not expand Medicaid), and compares them to uninsured patients seen at free clinics without a history of cancer.

Materials and Methods

This retrospective study involved the manual extraction of data from the medical charts of all uninsured patients who visited ten free clinics in the Tampa Bay area over the course of 3 calendar years (2016–2018). These ten clinics served only uninsured patients and relied on medically certified, volunteer providers. Medical and undergraduate student research volunteers were trained and mentored to conduct a thorough extraction of data from paper and electronic records. The training involved completing an online Collaborative Institutional Training Initiative (CITI) training course as well as attending an in person training session that discussed the systematic method of chart review. Each team consisted of at least 1 to two medical students who advised undergraduate students throughout the chart review process to ensure proper data abstraction techniques. Cancer prevalence was defined as the proportion of patients who had ever been diagnosed with cancer, as documented in their charts. More specifically, a "cancer survivor" was any person with a documented history of cancer or a self-reported cancer diagnosis. Cancer screening was defined as colon cancer screening by colonoscopy, breast cancer screening by mammography, or cervical cancer screening by Pap smear, as documented by a provider's note or by imaging or procedure report. Only cancer screenings that were up to date at the time of the patient's last visit were included in the analysis. All documented cancer screenings were presumed to be ordered or conducted in the free clinic setting given the patients' uninsured status, however, it is possible that some patients had cancer screenings performed elsewhere, and the results were sent in to the free clinic to be documented in the patient's chart. Mammography was chosen as the method of breast cancer screening as other breast imaging modalities were infrequently reported. Similarly, human papillomavirus co-testing was infrequently reported and was not included in the analysis. Fecal occult blood test and fecal immunohistochemical were infrequently reported and were

therefore excluded as a form of colon cancer screening. Prostate cancer, lung cancer, and skin cancer screening were excluded due to limited documentation of these screenings in free clinics. The free clinics included in the study varied in terms of what screening resources were available on site. Most had the ability to conduct pap smears on site. The majority of the free clinics had resources in place to refer patients for mammogram and colonoscopy through community partnerships and supplemented with grants. Age-appropriate cancer screening was defined as men and women 50 years and older receiving a colonoscopy, women 50 years and older receiving a mammogram, women 21–65 years of age receiving a Pap smear based on the United States Preventive Services Task Force recommendations (USPSTF).[12-14] Colonoscopy, mammography, and Pap smears documented as screenings were abstracted from all patient charts.

Demographic and socioeconomic variabales including age, sex assigned at birth, race, ethnicity, employment status, salary, and household size were abstracted. Subset analyses were performed to describe screening rates among patients with and without cancer histories to determine whether age- and sex-appropriate screenings were administered. These variables were chosen as they have been documented in the literature to affect likelihood of cancer screening.[15-18]

Time since diagnosis and the median number of free clinic follow-up visits were also calculated. Follow-up visits were typically for the purpose of following up on chronic diseases as described in a prior study; however, these visits present another opportunity for cancer screenings to be discussed or performed.[16]

This study was approved by the University of South Florida's Institutional Review Board (IRB# CR2_Pro00023920), and each clinic provided consent to access and extract their patient data. Study data were collected and managed using REDCap electronic data capture tools hosted at the University of South Florida.[17] We report frequencies for categorical variables and median (minimum to maximum) for continuous variables. Frequencies for associations between patient socioeconomic variables, cancer diagnosis, and screening practices were reported. The association between categorical variables was assessed by chi-square or Fisher's exact test. The differences in the distribution of continuous variables (for example, median follow-up visits) across categorical variable (for example, cancer history) were investigated using the Mann–Whitney U test. The predictors of adherence to cancer screening were analyzed using the multivariate binary logistic regression analysis to report odds ratio (OR) and 95% confidence intervals (95%CI). All analyses were performed in SPSS Statistics for Windows, version 26.[18]

Results

From 2016 to 2018, 13 982 uninsured patients were seen in ten free clinics in Tampa Bay. Cancer history was not elicited or documented in the medical charts of the 5614 (40.2%) patients and was thus excluded from analyses. These excluded patients were younger (mean age: 38 years; SD: 17) and more likely to have other missing data. Hence, our analysis cohort included 8368 patients. In these 3 years, 4.8% (402/8368) of patients were identified as having cancer histories. The remaining 95.2% (7966/8368) of patients had a documented negative history of cancer. We have previously reported a description of the malignancies analyzed in one year from this population.[16] Time since diagnosis was calculated as the difference between the date of the most recent follow-up visit in the free clinic and the date of a cancer diagnosis. This was approximately 7.1 years on average (8.6 SD). Collectively, patients with a documented cancer history had a median of 3 follow-up visits per year (range: 1–37) compared to patients without cancer histories with a median of 2 visits per year (range: 1–35); (P <.001). Of the 402 cancer survivors, 65.8% (264/402) were female. The cancer survivors were significantly older (median: 56.0 years; range: 6–89), than patients without cancer (median: 43.50, range: 0–98) (P < .001). The cancer survivors had significantly more comorbidities (Charlson comorbidity index score mean: 3.08; SD: 2.30) than patients without cancer (Charlson comorbidity index score mean: .95; SD: 1.30); (P < .001) (Table 1). Some of the key cancer diagnoses were as follows: a total of 20.4% (82/402) had breast cancer, 8.2% (33/402) had squamous cell skin cancer, 7.5% (30/402) had cervical cancer, 7.2% (29/402) had other undocumented types of cancer, 6.7% (27/402) had thyroid cancer, 5.9% (24/402) had CRC, 4.5% (18/402) had basal cell skin cancer, 3.5% (14/402) had ovarian cancer, 3.5% (14/402) had lung cancer, and 3.2% (13/402) had melanoma.

Colonoscopy for CRC Screening

A total of 3250 patients were older than 50 years and eligible for a CRC screening via a colonoscopy. Out of these 3250 patients, 8.8% (285/3250) were cancer survivors, and 91.2% (2965/3205) were patients without a history of cancer. A total of 7.5% (243/3250) of patients underwent CRC screening. The patients with a history of cancer were more likely to undergo CRC screening (15.4%, 44/285) than patients without any history of cancer (6.7%, 199/2965) (P < .001) (Table 3). Among the 18 CRC survivors, 38% (7/18) underwent a colonoscopy.

There was no statistically significant difference between male vs female patients without a cancer history undergoing age-appropriate CRC screening (P = .10). That is, a total of 8.1% (152/1868) of eligible female patients underwent CRC screening, while a total of 6.6% (91/1376) of eligible male patients underwent CRC screening. Similarly, within the population of cancer survivors, there was no statistically significant difference between males vs females undergoing age-appropriate CRC screening (P = .43). Specifically, 17.5% (20/114) of male cancer survivors underwent CRC screening compared with 14.1% (24/170) of female patients.

Table 1. Characteristics of cancer survivors and study participants without a cancer history.

Characteristic	Cancer survivors (n = 402)	Patients without a history of cancer (n = 7966)	P-value
Age, median (min–max)	56 (6–89)	44 (1–98)	<.001
Male, N (%)	137 (34)	3260 (41)	.09
Race, N (%)			<.001
Asian	7 (1.7)	191 (2.4)	
Non-Hispanic Black	25 (6.2)	976 (12.3)	
Non-Hispanic White	163 (40.5)	1429 (17.9)	
Hispanic	131 (32.6)	3171 (39.8)	
Other	76 (18.9)	2199 (27.6)	
Charlson comorbidity index score	3 (0-11)	0 (0-15)	<.001
Employed, N (%)	101 (45)	2131 (51)	.11
Salary (in US dollars), median (min–max)	231 (0–3595)	180 (0–21 997)	.54
Household size, median (min–max)	1 (1–7)	2 (1–11)	<.001

Table 2. Combined demographic characteristics of all study participants eligible for screening across cancer screenings.

Variable	Breast cancer screening (age 50 plus)			Cervical cancer screening (age 21 to 65 years)			Colon cancer screening (age 50 plus)		
	Yes	No	P-value	Yes	No	P-value	Yes	No	P-value
Age, median (min–max)	57 (50–81)	58 (50–98)	<.001	45 (21–65)	46 (21–65)	.97	57 (50–88)	58 (50–98)	.24
Male, N (%)							91 (37.4)	1285 (42.8)	.10
Race, N (%)			.001			<.001			.08
Asian	11 (2.6)	45 (4.1)		12 (1.4)	75 (2.3)		10 (5)	93 (4)	
Non-Hispanic Black	44 (10.6)	145 (13.3)		79 (9.3)	373 (11.2)		26 (13)	292 (12.7)	
Non-Hispanic White	124 (29.8)	282 (25.8)		186 (21.9)	619 (18.7)		66 (33)	696 (30.2)	
Hispanic	228 (54.8)	547 (50)		518 (61.1)	1383 (41.7)		95 (47.5)	1075 (46.7)	
Other	9 (2.2)	74 (6.8)		53 (6.3)	868 (26.2)		3 (1.5)	147 (6.4)	
Employed, N (%)	141 (52)	306 (40.3)	.001	315 (57.2)	882 (49.9)	.003	70 (54.3)	702 (42.8)	.01
Salary (in US dollars), median (min–max)	713 (0– 6606)	0 (0– 10 001)	<.001	800 (0–6606)	320 (0–10 001)	<.001	964 (0–6606)	0 (0–21 997)	<.001
Household size, median (min–max)	2 (1–7)	1 (1–8)	<.001	2 (1–10)	2 (1–11)	<.001	2 (1–7)	1 (1–8)	<.001

There was no statistically significant difference in the number of patients receiving vs not receiving age-appropriate CRC screening based on age and race (Table 2). However, the patients receiving age-appropriate CRC screening were more likely to be employed, had higher salaries, and had more members in their household than patients not receiving age-appropriate CRC screening (Table 2). After adjusting for age, gender, race, salary, employment status, and household size, cancer survivors were more likely to undergo CRC screening (OR: 3.59, 95% CI: 2.10–6.15) than patients without a cancer history.

Mammography for Breast Cancer Screening

A total of 1868 female patients were older than 50 years and eligible for breast cancer screening via a mammogram. Out of these 1868 patients, 9.1% (170/1868) were cancer survivors, and 90.9% (1698/1868) were patients without a history of cancer. The patients with a history of cancer were more likely to undergo mammography (44.1%, 75/170) than patients without any history of cancer (22.1%, 376/1698) (P < .001) (Table 3). Among the 54 breast cancer survivors, 55% (30/54) underwent a mammogram (Table 4).

The patients receiving age-appropriate breast cancer screening were more likely to be younger, employed, had higher salaries, and had more members in their household than patients not receiving age-appropriate breast cancer screening (Table 2). Also, only 2.2% of patients from other racial backgrounds underwent age-appropriate breast cancer screening, while there was no statistically significant difference in screening participation of patients of all other racial backgrounds (Table 2). Nonetheless, after adjusting for age, race, salary, employment status, and household size, cancer survivors were more likely to undergo breast cancer screening via a mammogram (OR: 2.13, 95% CI: 1.30–3.48) (Table 5) than patients without a cancer history.

PAP Smear for Cervical Cancer Screening

A total of 4166 female patients were between ages 21 to 65 years and eligible for cervical cancer screening via a pap

Table 3. Age-appropriate cancer screening rates among cancer survivors and patients without a cancer history.

Cancer screening	Cancer survivors screened/ total eligible; n (%)	Patients without cancer history screened/ total eligible; n (%)	P-value
Colorectal cancer screening[a]	44/285 (15.4)	199/2965 (6.7)	<.001
Breast cancer screening[a]	75/170 (44.1)	376/1698 (22.1)	<.001
Cervical cancer screening	59/246 (23.9)	789/3920 (20.1)	.14

[a]age 50 years and older.

Table 4. Predictors of CRC screening among cancer survivors and study participants without a cancer history.

Patient characteristic	Odds ratio (95% confidence intervals)	P-value
Cancer survivors	3.59 (2.10–6.15)	<.001
Patients without a history of cancer	Reference category	—
Age	1.00 (.97–1.04)	.71
Gender		
Male	Reference category	—
Female	1.18 (.75–1.84)	.46
Race		
Asian	2.14 (.22–20.68)	.51
Non-Hispanic Black	2.33 (.29–18.46)	.42
Non-Hispanic White	.97 (.12–7.51)	.98
Hispanic	1.75 (.22–13.47)	.59
Other	Reference category	—
Salary	1.00 (1.00–1.00)	.03
Employment status		
Employed	Reference category	—
Unemployed	1.13 (.69–1.86)	.61
Household size	1.41 (1.16–1.71)	.001

The multivariate model included and adjusted for: Cancer survivor status, age, gender, race, salary, employment status, and household size.

Table 5. Predictors of breast cancer screening among cancer survivors and study participants without a cancer history.

Patient characteristic	Odds ratio (95% confidence intervals)	P-value
Cancer survivors	2.13 (1.30–3.48)	.002
Patients without a history of cancer	Reference category	—
Age	.97 (.95–1.00)	.07
Race		
Asian	2.47 (.40–15.10)	.32
Non-Hispanic Black	2.02 (.41–9.97)	.38
Non-Hispanic White	2.24 (.47–10.66)	.30
Hispanic	1.91 (.40–9.18)	.41
Other	Reference category	—
Salary	1.00 (1.00–1.00)	.007
Employment status		
Employed	Reference category	—
Unemployed	1.14 (.75–1.74)	.52
Household size	1.01 (.84–1.20)	.90

The multivariate model included and adjusted for: Cancer survivor status, age, gender, race, salary, employment status, and household size.

Table 6. Predictors of cervical cancer screening among cancer survivors and study participants without a cancer history.

Patient characteristic	Odds ratio (95% confidence intervals)	*P*-value
Cancer survivors	.99 (.62–1.58)	.97
Patients without a history of cancer	Reference category	—
Age	.99 (.98–1.00)	.22
Race		
Asian	1.95 (.72–5.30)	.18
Non-Hispanic Black	1.58 (.79–3.17)	.19
Non-Hispanic White	2.34 (1.25–4.38)	.007
Hispanic	1.93 (1.01–3.69)	.04
Other	Reference category	—
Salary	1.00 (1.00–1.00)	.002
Employment status		
Employed	Reference category	—
Unemployed	1.22 (.92–1.62)	.16
Household size	1.07 (.99–1.15)	.06

The multivariate model included and adjusted for: Cancer survivor status, age, gender,race, salary, employment status, and household size.

smear. Out of these 4166 patients, 5.9% (246/4166) were cancer survivors, and 94.1% (3920/4166) were patients without a history of cancer. A total of 20.4% (848/4166) underwent cervical cancer screening via a pap smear. There was no statistically significant difference in the proportion of patients with a history of cancer undergoing cervical cancer screening (24%: 59/246) than patients without any history of cancer (20.1%: 789/3920) (*P = .14*) (Table 3). Among the 31 cervical cancer survivors, 32% (10/31) underwent a pap smear.

There was no statistically significant difference in the number of patients receiving vs not receiving age-appropriate cervical cancer screening based on age. However, the patients receiving age-appropriate cervical cancer screening were more likely to be employed, had higher salaries, and had more members in their household than patients not receiving age-appropriate breast cancer screening (Table 2). After adjusting for age, race, salary, employment status, and household size, there was no statistically significant difference in the likelihood of cancer survivors undergoing cervical cancer screening compared with patients without a cancer history (OR: 0.99, 95% CI: .62–1.58) (Table 6).

Discussion

Our study discusses screening rates of colon, breast, and cervical cancer among uninsured cancer survivors seen at free clinics in the Tampa Bay Area and compares to uninsured patients without a cancer history. Our study revealed the following: average age and sex assigned at birth differed across screenings, screening rates were higher among employed and higher income earning individuals across all 3 screenings, uninsured cancer survivors had more clinic visits than uninsured patients without a history of cancer. Larger household size increased the likelihood of screening, and uninsured cancer survivors had higher breast and colon cancer screening rates than age-eligible uninsured patients without a cancer history.

Nonetheless, screening rates among uninsured cancer survivors were still much lower when compared to screening rates among the insured population.[1]

Within our sample, more age-eligible women underwent a mammogram (24.1%) than a pap smear (20.4%). Only 6.7% of eligible men and women without a cancer history and 15.4% of cancer survivors underwent CRC screening which may be in part due to the numerous financial and logistical obstacles uninsured patients may face accessing a colonoscopy. There was no statistically significant difference between percentage of men and women receiving CRC screening in the cancer survivor group when compared to patients without a history of cancer. This is consistent with a recent study that showed no significant gender-based difference in CRC screening practices.[19]

The patients who received screenings were younger, on average, than those who did not. However, there were no significant differences in age of participants receiving CRC and cervical cancer screening, while the patients receiving a mammogram were significantly younger than patients not receiving it. To our knowledge, no published data exists on the adherence to cancer screenings in the uninsured population based on age. Our results suggest efforts should be made to increase cancer screening in older uninsured cancer survivors and uninsured patients without a cancer history.

The median salary was higher in screened individuals across all three screenings, which is consistent with published literature. One study found that higher income was positively associated with breast, cervical, and colorectal cancer screening.[20] Another study similarly found that lower-income was associated with a lower rate of colorectal screening.[21]

Our free clinic population had a significant prevalence of cancer survivors. The clinics are critical for patients with and without a cancer history to have an opportunity for screening and early detection for cancer. However for cancer survivors at

increased risk for secondary malignancies, they offer a specific opportunity for cancer survivorship care with regular follow-ups for cancer screenings as well as provide care for other chronic conditions. Our free clinic population was composed of 4.8% cancer survivors, which his higher than the documented prevalence of approximately 3% cancer survivors in the adult community health center population[22] The patients with histories of cancer in our study had higher numbers of clinic visits (median of 3 clinic visits per year) than their counterparts without cancer history (median of two clinic visits per year), which is encouraging given the evidence that the frequency of primary care visits correlates with better health outcomes among cancer survivors.[23] It is recommended that cancer survivors follow-up three to four times per year during the first two to three years of their cancer treatment, and although the cancer survivors included in our study were on an average 7.1 years since their initial cancer diagnosis, it is reassuring that they are following up in clinic approximately 3 times per year.[23] The higher frequency of clinic visits by cancer survivors than non-cancer survivors could suggest the effective use of surveillance for their specific cancer diagnoses, screening for new primary malignancies, and attentiveness of providers to a high-risk population. Cancer survivors may also be more proactive and self-directed in their medical care. Additionally, cancer survivors had a statistically significantly higher Charleston Comorbodity Index Score than patients without a cancer history. This indicates a higher burden of chronic disease, and therefore the need for more clinic visits, which is further described in a prior study of this population.[16]

Our study also revealed that larger household size was associated with higher likelihood of screening across all 3 screenings. Larger household size can increase one's network of social support, as well as facilitate the feasibility of screenings with transportation assistance to clinic visits for example. One study found that increased social support correlated with higher likelihood of breast and cervical cancer screening.[24]

Among the uninsured cancer survivors in our study, only 15.4% (44/285) received age-appropriate CRC screening. This suboptimal screening rate is consistent with prior literature as historically, underserved populations have had lower screening rates for malignancies, such as CRC.[25] The CRC screening rate was lower among the uninsured patients without cancer histories, of whom 6.7% (199/2965) had received age-appropriate CRC screenings. Cancer survivors in our study may have had higher screening rates than their uninsured counterparts without a cancer history for a variety of reasons including being more active in their medical care, clinician awareness, and more. The data in the literature is mixed as to whether or not cancer survivors receive more screenings than patients without a cancer history.[26] There is, however, limited published data on screening patterns in uninsured cancer patients specifically. Colorectal cancer screening rates of the cancer survivors and patients without a cancer history in our study were much lower than the national, age-appropriate CRC screening rate of patients with private insurance (72%) and patients

with Medicare (62%) in 2018.[27] The importance of screening uninsured patients for colon cancer was highlighted by a prior study conducted of the entire free clinic population included in our study, and described how risk factors for colon cancer are high amongst this uninsured population.[28]

Our study found a significant disparity among the patients who completed cervical cancer screenings compared to the insured population. Our study found that 23.9% of cancer survivors and 20.1% of patients without cancer histories received age-appropriate cervical cancer screenings, and had age-appropriate cervical cancer screenings. Screening rates across both groups are lower than the national average of age-appropriate cervical cancer screening of 59% for patients with commercial insurance and 47% for patients with Medicaid insurance.[29]

Our study then found that 44.1% (75/170) of cancer survivors had completed age-appropriate breast cancer screening and 22.1% (376/1698) of patients without cancer histories completed age-appropriate breast cancer screening. This is lower than the national average of 75% of age-appropriate breast cancer screening in insured women in 2018.[30]

Previous research uncovered many potential causes (e.g., no access, poor awareness, or high cost) for the particularly low proportion of cancer screenings in the uninsured population.[31] In our study, the screening rates of uninsured patients cared for in free clinics are lower than the national averages previously reported.[32] Even though the patients in our study with cancer histories had higher rates of breast and colon cancer screening than those without cancer histories, their rates were still significantly lower than national averages. Future studies are needed to identify the barriers uninsured cancer survivors face to obtain cancer screenings and inform how to improve access to care. This information could help influence clinic practice and lead to potential interventions to improve screening utilization among free clinic patients.

Free clinics are an ideal setting to increase preventative screenings among the uninsured through directed efforts to provide resources to this vulnerable population of patients. One study showed that a student-run free clinic was able to increase CRC screening rates in the uninsured to 3 times the national average through a grant-funded CRC screening program.[33] The same clinic recorded an increase in cervical cancer screening adherence in uninsured women above the national average for insured and uninsured populations of women.[34] Breast cancer screenings were also increased at this clinic by providing vouchers for mammograms to women who were due for mammograms.[35] While our study highlights screening rates in the uninsured seen at various free clinics throughout the community, student-run clinics with academic resources represent an ideal model for which interventions drive quality improvements. There are a number of methods that free clinics can implement to improve cancer screening rates in patients with and without cancer histories. Free clinics can provide patient education on the importance of screening, schedule appropriate follow-up appointments to avoid patients becoming lost to follow-up, build community partnerships to attain appropriate resources for screenings, and more.

There are several limitations to this study. The data available for analyses were limited based on the retrospective nature of this study. Therefore, it was difficult to ascertain whether the diagnostics utilized were for surveillance for their primary cancer or screening for potential secondary malignancies. Family history was poorly reported; thus, some patients may have received elective colonoscopies before age 50, given that colon cancer screening should be initiated at 40 years of age or 10 years prior to a first-degree relative's colon cancer diagnosis.[36] Additionally, cancer survivors may require more frequent or infrequent cancer screenings based on cancer type and surgical history. Cancer survivors with a history of mastectomy or hysterectomy may not require breast or cervical cancer screening and CRC patients are recommended to have a colonoscopy approximately 1 year after surgery.[37] Our analysis does not take this into account, as surgical history was not always fully elucidated in free clinic charts. It is also important to note that we had to exclude 40% of the patients in this sample due to missing data on cancer diagnosis from our analysis cohort.

Screening dates, frequencies of cancer screening practices, and data that could help determine the age and sex appropriateness of screenings were not consistently documented and available. One explanation for this could be that free medical clinics are more focused on treating acute illnesses than chronic illness or preventative care. However, with the projected growth of cancer survivors in the years to come, free clinics will likely experience an increased rate of patients who are cancer survivors. Effective methods to support surveillance and screenings are much needed to address the long-term effects of cancer therapy in this population.

Additionally, likelihood of cancer screening varied across race and ethnicity, however, the study was not powered to draw conclusions about differences in cancer screenings based on race or ethnicity. Racial disparities in cancer screening are an extremely important topic that should be examined in future studies of uninsured cancer survivors.

Conclusion

Our research examines cancer screening adherence rates among cancer survivors who sought care in free clinics and compares screening rates to the free clinic patients without a history of cancer. A significant disparity in screening rates for colorectal, breast, and cervical cancer persists between the uninsured population with and without cancer histories and their insured counterparts. Screening rates in uninsured cancer survivors are only modestly better than their counterparts without a cancer history, yet still below the national average for each screening test we studied. Free clinics serve an important role in providing primary care to uninsured patients and are well positioned to support cancer survivorship care for uninsured cancer survivors. Further study is warranted to determine how to utilize the current infrastructure of free clinics to increase screening and early detection of cancer. Our study underlines the importance of examining cancer screening adherence rates and shifting toward a more deliberate preventative healthcare paradigm within free clinics for cancer specifically. We hope this study raises awareness about the increasing role free clinics can play in delivering cancer survivorship care for a growing population of uninsured cancer survivors.

Abbreviations

CITI, Collaborative Institutional Training Initiative; CRC, colorectal cancer; fecal immunohistochemical test; FOBT, fecal occult blood test; HPV, human papillomavirus; NBCCEDP, National Breast and Cervical Cancer Early Detection Program; OR, odds ratio; PAP, papanicolaou; USPSTF, U.S. Preventive Services Task Force.

Ethics Statement

This study was approved by the University of South Florida's Institutional Review Board (IRB# CR2_Pro00023920), and each clinic provided consent to access their patient data. Informed consent to access individual patient charts was waived by the IRB due to the retrospective nature of the study.

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