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ORIGINAL ARTICLE

Use of screening tests, diagnosis wait times, and wait-related satisfaction in breast and prostate cancer

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ABSTRACT

Background

Understanding factors relating to the perception of wait time by patients is key to improving the patient experience.

Methods

We surveyed 122 breast and 90 prostate cancer patients presenting at clinics or listed on the cancer registry in Newfoundland and Labrador and reviewed their charts. We compared the wait time (first visit to diagnosis) and the wait-related satisfaction for breast and prostate cancer patients who received regular screening tests and whose cancer was screening test–detected ("screen/screen"); who received regular screening tests and whose cancer was symptomatic ("screen/symptomatic"); who did not receive regular screening tests and whose cancer was screen test–detected ("no screen/screen"); and who did not receive regular screening tests and whose cancer was symptomatic ("no screen/symptomatic").

Results

Although there were no group differences with respect to having a long wait (greater than the median of 47.5 days) for breast cancer patients (47.8% screen/screen, 54.7% screen/symptomatic, 50.0% no screen/screen, 40.0% no screen/symptomatic; $p = 0.814$), a smaller proportion of the screen/symptomatic patients were satisfied with their wait (72.5% screen/screen, 56.4% screen/symptomatic, 100% no screen/screen, 90.9% no screen/symptomatic; $p = 0.048$).

A larger proportion of screen/symptomatic prostate cancer patients had long waits (>104.5 days: 41.3% screen/screen, 92.0% screen/symptomatic, 46.0% no screen/screen, 40.0% no screen/symptomatic; $p = 0.011$) and a smaller proportion of screen/symptomatic patients were satisfied with their wait (71.2% screen/screen, 30.8% screen/symptomatic, 76.9% no screen/screen, 90.9% no screen/symptomatic; $p = 0.008$).

Conclusions

Diagnosis-related wait times and satisfaction were poorest among patients who received regular screening tests but whose cancer was not detected by those tests.

KEY WORDS

Cancer screening, wait times, patient satisfaction, breast cancer, prostate cancer

1. INTRODUCTION

Routine screening has led to the detection of cancer in many otherwise asymptomatic patients. Studies have shown that, compared with patients whose cancer was symptomatic (that is, self-detected), screen-detected cancers have more favourable clinicopathologic features that in turn result in better prognosis and outcome[1–9]. For example, researchers found that screen-detected tumours in the breast[1,4,8] and prostate[2,3,6,7] are smaller, less likely to have metastasized, of earlier stage, and of lower histologic grade. Compared with their symptomatic counterparts, women whose cancers were screen-detected also had a better overall prognosis and a better rate of 5-year breast cancer–free survival[4]. British researchers suggest that, compared with their self-detected counterparts, patients whose colorectal cancer is detected through a fecal occult blood test screening program have better 5-year outcomes because screening detected a higher proportion of cancers at an earlier stage, when the patients could be managed with curative rather than palliative treatment[5]. This is not to suggest that cancer screening does not also potentially create harm. Various reviews have noted that screening also leads to false-positive results, overdiagnosis, unnecessary

treatment, and psychosocial distress for years after the initial false-positive test result[10–12].

Does participation in routine cancer screening improve the wait time to a cancer diagnosis? In this article, "screening" means the regular use of screening tests, regardless of whether the tests are part of a population-based screening program. Despite the available literature on cancer detection through the regular use of screening tests, relatively little is known about the impact of the regular use of screening tests on wait time for a diagnosis and on the perception by patients of their wait time.

In a study of presurgical wait times for breast cancer patients, Mayo *et al.*[13] observed that each additional investigative procedure increased the overall wait time between the initial mammogram and surgery. Only a handful of studies in Canada have examined the perceptions of actual patients about their experience of the wait time for a cancer diagnosis. In a study of colorectal cancer patients in Nova Scotia, researchers reported that the longest waits experienced by colorectal cancer patients preceded diagnosis and that a potential contributor to long pre-diagnostic waits was the family physician's level of suspicion about specific presenting symptoms[14]. Given those studies, we hypothesized that, compared with patients who initially presented to their physician with symptoms, patients whose cancers were detected through the use of regular screening tests would have a shorter wait time from first visit with a health care provider (about test results) to diagnosis and greater wait-related satisfaction. We reasoned that a positive screening test result would reduce the number of investigative tests needed, reduce the overall time to reach a cancer diagnosis, and improve patient satisfaction with the wait time.

The objective of the present study was therefore to compare the wait times and wait-related satisfaction of breast and prostate cancer patients by screening history (regular use of screening tests vs. no regular screening tests) and mode of cancer detection (screening test–detected vs. symptomatic). The goal was to examine the relationships between wait time, wait-related satisfaction, and regular use of screening tests. Our study is part of a larger project examining patient perceptions of wait times for cancer care. Understanding the underlying causes of negative public perceptions of wait times for cancer care is an important step in improving the timeliness of care and educating the public about the role of cancer screening.

2. METHODS

The Newfoundland and Labrador Health Research Ethics Board approved the study (HIC reference 09.37). We recruited cancer patients presenting at regional cancer clinics across the province (St. John's, Gander, Grand Falls–Windsor, and Corner Brook) and at Daffodil Place (a cancer lodge); we also mailed invitation letters to individuals identified in the provincial cancer registry.

The study used a retrospective design, recruiting patients after they had been diagnosed with cancer and had started their treatment regimen. To be eligible for the study, individuals had to be residents of Newfoundland and Labrador, able to communicate in English, 19 years of age or older, seeking treatment for their first cancer diagnosis, and diagnosed with breast, lung, colorectal, or prostate cancer between January 1, 2009, and June 30, 2011. (The larger study included only women with breast cancer.) We limited the present analyses to breast and prostate cancer patients because of the small sample sizes of lung and colorectal cancer patients recruited to the study.

Research assistants screened individuals for eligibility, obtained consent, and gathered data through surveys and cancer clinic chart reviews. The research assistants received extensive training and used scripted prompts and visual aids to conduct in-person surveys. The survey instrument was written in English at a grade 8 level and included questions to assess eligibility, dates in the care-seeking process (for example, the onset of symptoms, first presentation to a health care provider, and so on), clinical and screening history, and sociodemographic characteristics. Respondents were also asked to rate their satisfaction with interval-specific wait times (for example, from onset of symptoms to first visit with a health care provider, and so on) using a 5-point Likert scale, on which 1 was "not at all satisfied" and 5 was "very satisfied." The cancer clinic health record of each patient was reviewed to gather additional dates and clinical information.

The items included in the survey and chart review were identified through a literature review and consultations with cancer care providers, cancer patients, and representatives from the provincial division of the Canadian Cancer Society. Extensive pre-testing with patients and cancer care providers was conducted to ensure the reliability of the questions. Pre-testing resulted in changes in the wording and ordering of questions, but not the content of the instrument.

We used SPSS data-entry software to enter survey and chart review data into a database, and we used the IBM SPSS Statistics software (version 19.0: IBM, Armonk, NY, U.S.A.) to analyze the data. We used frequencies and cross-tabulations to correct data entry errors, and we consulted the original surveys and chart reviews to correct responses. To assess the representativeness of the sample, we used chi-square tests to compare the age and community of residence of respondents with data provided by the Cancer Registry (used to mail the study invitations).

We considered two outcomes in the analysis:

- Length of wait time from first visit to a health care provider to diagnosis
- Satisfaction with wait time from first visit to a health care provider to diagnosis

The questions used to calculate the wait time length were "When did you first see a health care professional about these symptoms/screening results?" and "When did someone tell you that you definitely had cancer?" Because the wait time data were skewed, we grouped the variables into two categories: "short wait" (equal to or less than the median wait time) and "long wait" (greater than the median wait time).

Wait time satisfaction was based on the question "Using a scale where 1 is 'very dissatisfied' and 5 is 'very satisfied,' in general, how satisfied are you with the time from your first visit to a health care provider until you were told you definitely have cancer?" Because the data were skewed, we recoded the data into two categories: "dissatisfied" (responses 1–3) and "satisfied" (responses 4–5).

The independent variable combined the use of regular screening tests and the mode of cancer detection. Use of regular screening tests was based on the question "Prior to your diagnosis, did you regularly participate in [cancer specific] screening?" The question was tailored to the respondent's type of cancer (for example, breast cancer patients were asked "Prior to your diagnosis, did you regularly participate in breast cancer screening?"). We made no attempt to limit responses to organized screening programs. Mode of cancer screening was based on the question "When did you first notice any symptoms?" for which one of the response options was "No symptoms—cancer picked up by screening." Patients were coded as symptomatic (had symptoms) or screen-detected (no symptoms). We combined those two variables to create four comparison groups: regular use of screening tests and cancer was screen-detected ("screen/screen"), regular use of screening tests and individual was symptomatic ("screen/symptomatic"), no regular use of screening tests and cancer was screen-detected ("no-screen/screen"), and no regular use of screening tests and individual was symptomatic ("no-screen/symptomatic"). The no-screen/screen group included individuals who did not receive regular screening tests and who were asymptomatic, but whose cancer was detected through a screening test (for example, the first time they had the test).

Other variables considered in the analyses included clinical and sociodemographic characteristics that, with the exception of cancer stage, would normally be known before diagnosis. We also examined the self-reported number of tests and visits for tests before diagnosis (because multiple tests could be performed during the same visit).

We analyzed breast and prostate cancer patients separately. We used frequencies to describe the characteristics of the sample. The chi-square test—or Fisher exact test, if applicable—was used to detect differences in the two outcomes and in the independent and control variables. In supplementary analyses, we compared the four groups for median wait time (Mann–Whitney *U*-test) and for number of diagnostic tests and visits for diagnostic tests (chi-square test). We repeated the analyses after removing outliers (wait times greater or equal to the 95th percentile) to assess the impact of extreme wait times.

3. RESULTS

Of the 652 patients who indicated interest in the study, 335 were eligible and completed the survey. After excluding lung and colorectal cancer patients, the study sample consisted of 122 women with breast cancer and 90 men with prostate cancer. In terms of representativeness, the sample of breast cancer patients overrepresented women less than 65 years of age and resident in a rural area (Table I). The sample of prostate cancer patients was representative of the eligible population in terms of age and community of residence.

A large proportion of the breast cancer patients were less than 65 years of age, were married or partnered, had more than a high school education, and were diagnosed with an early-stage breast cancer (Table II). Among the 108 women (88.5%) who said they received some form of regular breast cancer screening test, 46 (42.6%) performed breast self-exams, 44 (40.7%) received clinical breast exams, 92 (85.2%) received mammography, and 4 (3.7%) reported some other screening test.

For breast cancer patients, the median wait time from first visit to a health care provider to diagnosis was 47.5 days. The range was 0–819 days, with a 90th

TABLE I Representativeness of population sample, breast and prostate cancer patients

Variable	*Population*[a] *[N (%)]*	*Sample [n (%)]*	p *Value*
Breast cancer patients			
Age			<0.05
<65 Years	252 (64.1)	102 (83.6)	
≥65 Years	141 (35.9)	20 (16.4)	
Community of residence			<0.05
Urban	118 (29.8)	38 (31.1)	
Semi-urban	47 (11.9)	24 (19.7)	
Rural	231 (58.3)	60 (49.2)	
Prostate cancer patients			
Age			>0.05
<65 Years	133 (39.6)	34 (37.8)	
≥65 Years	203 (60.4)	56 (62.2)	
Community of residence			>0.05
Urban	56 (16.6)	21 (23.3)	
Semi-urban	73 (21.7)	16 (17.8)	
Rural	208 (61.7)	53 (58.9)	

[a] Based on cancer registry data provided to the study.

TABLE II Characteristics of the breast and prostate cancer patients in the study sample

Characteristic	*Patients*[a] *[n (%)] with*	
	Breast cancer	*Prostate cancer*
Patients	122	90
Age		
<65 Years	102 (83.6)	34 (37.8)
≥65	20 (16.4)	56 (62.2)
Community of residence		
Urban	38 (31.1)	21 (23.3)
Semi-urban	24 (19.7)	16 (17.8)
Rural	60 (49.2)	53 (58.9)
Marital status		
Married or equivalent	100 (82.0)	79 (87.8)
Single	22 (18.0)	11 (12.2)
Employment situation		
Full time	24 (19.7)	10 (11.1)
Part time/seasonal	14 (11.5)	7 (7.8)
Sick leave	28 (23.0)	8 (8.9)
Unemployed/homemaker/student	21 (17.2)	4 (4.4)
Retired	35 (28.7)	61 (67.8)
Level of education completed		
High school or less	47 (38.8)	45 (50.0)
More than high school	74 (61.2)	45 (50.0)
Household income		
<$30,000	24 (22.0)	19 (24.4)
$30,000–$59,000	40 (36.7)	31 (39.7)
>$60,000	45 (41.3)	28 (35.9)
Number of diagnostic tests		
1–2	24 (19.7)	40 (44.4)
≥3	98 (80.3)	50 (55.6)
Visits for diagnostic tests		
1–2	53 (43.4)	64 (71.1)
≥3	69 (56.6)	26 (28.9)
Stage of cancer		
Early	73 (74.5)	26 (31.7)
Late	25 (25.5)	56 (68.3)
Satisfaction with wait time		
Unsatisfied	39 (32.5)	28 (31.5)
Satisfied	81 (67.5)	61 (68.5)
Screening group		
Regular screening test		
Screen-detected	51 (42.1)	53 (58.9)
Symptomatic	56 (46.3)	13 (14.4)
No regular screening test		
Screen-detected	3 (2.5)	13 (14.4)
Symptomatic	11 (9.1)	11 (12.2)

[a] Total responses may not exactly match patient numbers because of missing answers.

percentile of 256 days. Compared with the group of women having short wait times, the group having long wait times contained a larger proportion women who underwent 3 or more tests and who had 3 or more visits for tests (Table III). There were no statistically significant differences between breast cancer patients with short and with long wait times (Table III).

Supplementary analyses confirmed that there was no significant difference in the median wait time for each group of breast cancer patients (screen/screen: 43 days; screen/symptomatic: 60 days; no-screen/screen: 40 days; no-screen/symptomatic: 34 days) nor any significant difference in the number of diagnostic tests or the number of visits for diagnostic tests (Table IV). The trimming of outliers from the sample did not change the results.

Approximately two thirds (67.5%) of the breast cancer patients said that they were satisfied with their wait time. Compared with the group of unsatisfied women, the group of satisfied women had a larger proportion of individuals undergoing 1 or 2 diagnostic tests and a smaller proportion of individuals who received regular screening tests, but who had symptomatic cancer (Table III). There were no other significant differences in the characteristics of breast cancer patients who were satisfied and unsatisfied with their wait time from first visit to a health care provider to diagnosis.

Most of the prostate cancer patients were 65 years of age or older, lived in a rural community, were married or partnered, were retired, had been diagnosed with a late-stage prostate cancer, and were satisfied with their wait time (Table II). Among the 66 men who said they received some form of regular prostate cancer screening test, 29 (43.9%) received digital rectal examinations, 64 (97.0%) received prostate-specific antigen tests, and 4 (6.1%) reported some other form of screening test.

For prostate cancer patients, the median wait time from first visit to a health care provider to diagnosis for prostate cancer was 104.5 days. The range was 0–4609 days, with a 90th percentile of 455.3 days. Compared with the group of prostate cancer patients who had short wait times, the group with long wait times had a larger proportion of men who made 3 or more visits for diagnostic tests and a larger proportion who received regular screening tests, but who developed symptomatic cancer. There were no other significant differences in the characteristics of prostate cancer patients with short and with long wait times (Table V).

Supplementary analyses showed that the median wait time for screen/symptomatic participants was significantly longer than that for any of the other groups (screen/screen: 91.5 days; screen/symptomatic: 272 days; no-screen/screen: 86 days; no-screen/symptomatic: 92 days). The median times of the other three groups did not significantly differ. There was also no difference between the

groups with respect to the number of diagnostic tests or the number of visits for diagnostic tests (Table IV).

More than two thirds (68.5%) of prostate cancer patients said that they were satisfied with their wait time. Compared with the group of men who were satisfied, the group of men who were unsatisfied had a larger proportion of screen/symptomatic individuals (Table V). There were no other significant differences in the characteristics of satisfied and unsatisfied prostate cancer patients. Results did not change after outliers had been removed from the sample.

TABLE III Wait time and satisfaction from first visit to diagnosis for breast cancer patients

Characteristic	*First visit to cancer diagnosis*					
	*Wait time [*n *(%)]*[a]			*Satisfaction [*n *(%)]*[a]		
	Short	*Long*	p *Value*	*Unsatisfied*	*Satisfied*	p *Value*
Age			0.052			0.530
<65 Years	46 (80.7)	53 (93.0)		34 (87.2)	67 (82.7)	
≥65 Years	11 (19.3)	4 (7.0)		5 (12.8)	14 (17.3)	
Community of residence			0.970			0.562
Urban	17 (29.8)	17 (29.8)		11 (28.2)	25 (30.9)	
Semi-urban	11 (19.3)	12 (21.1)		10 (25.6)	14 (17.3)	
Rural	29 (50.9)	28 (49.1)		18 (46.2)	42 (51.9)	
Marital status			0.430			0.940
Married or equivalent	50 (87.7)	47 (82.5)		32 (82.1)	66 (81.5)	
Single	7 (12.3)	10 (17.5)		7 (17.9)	15 (18.5)	
Employment situation			0.316			0.360
Full time	7 (12.3)	15 (26.3)		7 (17.9)	16 (19.8)	
Part time/seasonal	7 (12.3)	6 (10.5)		4 (10.3)	10 (12.3)	
Sick leave	13 (22.8)	15 (26.3)		13 (33.3)	15 (18.5)	
Unemployed/homemaker/student	12 (21.1)	8 (14.0)		4 (10.3)	17 (21.0)	
Retired	18 (31.6)	13 (22.8)		11 (28.2)	23 (28.4)	
Level of education completed			0.564			0.997
High school or less	24 (42.1)	20 (35.7)		15 (39.5)	32 (39.5)	
More than high school	33 (57.9)	36 (64.3)		23 (60.5)	49 (60.5)	
Household income			0.408			0.666
<$30,000	13 (26.5)	9 (17.0)		6 (17.6)	18 (24.7)	
$30,000–$59,000	19 (38.8)	20 (37.7)		14 (41.2)	25 (34.2)	
>$60,000	17 (34.7)	24 (45.3)		14 (41.2)	30 (41.1)	
Number of diagnostic tests			0.018			0.006
1–2	16 (28.1)	6 (10.5)		2 (5.1)	21 (25.9)	
≥3	41 (71.9)	51 (89.5)		37 (94.9)	60 (74.1)	
Visits for diagnostic tests			<0.000			0.101
1–2	36 (63.2)	15 (26.3)		13 (33.3)	39 (48.1)	
≥3	21 (36.8)	42 (73.7)		26 (66.7)	42 (51.9)	
Stage of cancer			0.065			0.125
Early	37 (82.2)	31 (64.6)		20 (64.5)	52 (80.0)	
Late	8 (17.8)	17 (35.4)		11 (35.5)	13 (20.0)	
Screening group			0.814			0.048
Regular screening test						
Screen detected	25 (44.6)	23 (40.4)		14 (35.9)	37 (45.7)	
Symptomatic	24 (42.9)	29 (50.9)		24 (61.5)	31 (38.3)	
No regular screening test						
Screen detected	1 (1.8)	1 (1.8)		0 (0)	3 (3.7)	
Symptomatic	6 (10.7)	4 (7.0)		1 (2.6)	10 (12.3)	

[a] Total responses may not exactly match patient numbers because of missing answers.

TABLE IV Number of diagnostic tests and visits for breast and prostate cancer patients, by screening group

Variable	*Regular screening test [*n *(%)]*		*No regular screening test [*n *(%)]*		p *Value*
	Screen-detected	*Self-detected*	*Screen-detected*	*Self-detected*	
Breast cancer patients[a]					
Diagnostic tests					0.595
1–2	12 (23.5)	8 (14.3)	1 (33.3)	2 (18.2)	
≥3	39 (76.5)	48 (85.7)	2 (66.7)	9 (81.8)	
Visits for diagnostic tests					0.784
1–2	20 (39.2)	25 (44.6)	1 (33.3)	6 (54.5)	
≥3	31 (60.8)	31 (55.4)	2 (66.7)	5 (45.5)	
Prostate cancer patients[a]					
Diagnostic tests					0.851
1–2	23 (43.4)	6 (46.2)	7 (53.8)	4 (36.4)	
≥3	30 (56.6)	7 (53.8)	6 (46.2)	7 (63.6)	
Visits for diagnostic tests					0.518
1–2	39 (73.6)	7 (53.8)	10 (76.9)	8 (72.7)	
≥3	14 (26.4)	6 (46.2)	(23.1)	3 (27.3)	

[a] Total responses may not exactly match patient numbers because of missing answers.

4. DISCUSSION

Contrary to our hypothesis, receiving regular screening tests does not appear to result in a shorter wait time for diagnosis. The wait times were not significantly shorter for patients with screen-detected breast and prostate cancers than for patients who had not received regular screening tests. Moreover, the longest waits were experienced by patients who had received regular screening tests, but whose cancers were symptomatic. That finding suggests that negative screening-test results might lead physicians to use less urgency in investigating symptoms in screen/symptomatic patients than in the other three groups.

In our study population, the length of time to diagnosis was related to the number of diagnostic tests (or visits for diagnostic tests), a result that accords with findings in a previous study of women with breast cancer in Quebec[10]. However, there were no differences in the number of screening tests and visits for screening tests in the four screening groups in the study, although the small sample size limits statistical power to find differences. Although screening has been shown to detect cancers at an earlier stage, our study findings (albeit based on a small sample) suggest that regular use of screening tests does not reduce the total number of tests leading up to a diagnosis.

Regular use of screening tests does not lead to greater satisfaction with wait time. That observation is not surprising, given the finding that regular use of screening tests conferred no wait time advantage. In fact, the largest proportion of patients who were unsatisfied with their wait time included the patients who had received regular screening tests, but whose cancers were symptomatic. That finding might stem from the public's expectations of screening tests. For example, studies report that the public overestimates the potential benefit of cancer screening tests[15–17]. An Australian study found that women believed that mammography screening for breast cancer should detect all tumours. A study of breast cancer screening perceptions in 4 countries found that almost three quarters of surveyed women mistakenly believed that screening might prevent the breast cancer from occurring[17]. In that context, the dissatisfaction with wait time among our participants who received regular screening tests might stem in part from their expectations of screening activities. Participants who receive regular screening tests might be inclined to view their experiences less positively given their unmet (though often unrealistic) expectations of screening—doubly so for participants who received regular screening tests and had symptomatic cancers. Alternatively, patients who did not receive regular screening tests might be relieved to have received a diagnosis and more likely to view their wait time positively.

Differences in satisfaction scores might also be explained by underlying differences in the characteristics of individuals who choose to undergo regular screening tests and those who do not. For example, studies have found that, compared with their non-screened counterparts, individuals who participate in breast and prostate cancer screening activities have higher education and socioeconomic levels than those who do not engage in screening activities[18,19]. Women who take part in breast cancer screening are younger than their non-screening counterparts; men who participate in prostate cancer screening are older than

their non-screening counterparts[18,19]. Several studies have examined the relationship between underlying health beliefs, sociodemographic characteristics, and screening behaviors, but further research is needed to understand how such differences might affect perceptions of health system performance.

The present study has some limitations. The small sample size limits the ability to detect significant differences and to conduct multivariate analyses. Given the retrospective design, patients might not have accurately recalled the dates used to determine wait times. Moreover, wait-related satisfaction might be greater

TABLE V Wait time and satisfaction from first visit to diagnosis for prostate cancer patients

Characteristic	*First visit to cancer diagnosis*					
	*Wait time [*n *(%)]*[a]			*Satisfaction [*n *(%)]*[a]		
	Short	*Long*	p *Value*	*Unsatisfied*	*Satisfied*	p *Value*
Age			0.651			0.540
<65	17 (41.5)	15 (36.6)		12 (42.9)	22 (36.1)	
≥65	24 (58.5)	26 (63.4)		16 (57.1)	39 (63.9)	
Community of residence			0.713			0.944
Urban	10 (24.4)	7 (17.1)		6 (21.4)	15 (24.6)	
Semi-urban	7 (17.1)	8 (19.5)		5 (17.9)	10 (16.4)	
Rural	24 (58.5)	26 (63.4)		17 (60.7)	36 (59.0)	
Marital status			0.331			0.719
Married or equivalent	34 (82.9)	37 (90.2)		24 (85.7)	55 (90.2)	
Single	7 (17.1)	4 (9.8)		4 (14.3)	6 (9.8)	
Employment situation			0.222			0.561
Full-time	5 (12.2)	4 (9.8)		3 (10.7)	7 (11.5)	
Part-time/seasonal	4 (9.8)	3 (7.3)		3 (10.7)	4 (6.6)	
Sick leave	2 (4.9)	6 (14.6)		4 (14.3)	4 (6.6)	
Unemployed/homemaker/student	0 (0)	3 (7.3)		2 (7.1)	2 (3.3)	
Retired	30 (73.2)	25 (61.0)		16 (57.1)	44 (72.1)	
Level of education completed			0.269			0.597
High school or less	22 (53.7)	17 (41.5)		13 (46.4)	32 (52.5)	
More than high school	19 (46.3)	24 (58.5)		15 (53.6)	29 (47.5)	
Household income			0.323			0.121
<$30,000	7 (20.6)	8 (22.2)		5 (20.0)	14 (26.4)	
$30,000–$59,000	17 (50.0)	12 (33.3)		7 (28.0)	24 (45.3)	
>$60,000	10 (29.4)	16 (44.4)		13 (52.0)	15 (28.3)	
Diagnostic tests			0.182			0.236
1–2	21 (51.2)	15 (36.6)		10 (35.7)	30 (49.2)	
≥3	20 (48.8)	26 (63.4)		18 (64.3)	31 (50.8)	
Visits for diagnostic tests			0.031			0.016
1–2	33 (80.5)	24 (58.5)		15 (53.6)	48 (78.7)	
≥3	8 (19.5)	17 (41.5)		13 (46.4)	13 (21.3)	
Stage of cancer			0.892			0.700
Early	10 (28.6)	12 (30.0)		9 (34.6)	17 (30.4)	
Late	25 (71.4)	28 (70.0)		17 (65.4)	39 (69.6)	
Screening group			0.011			0.008
Regular screening test						
Screen detected	27 (65.9)	19 (46.3)		15 (53.6)	37 (60.7)	
Symptomatic	1 (2.4)	12 (29.3)		9 (32.1)	4 (6.6)	
No regular screening test						
Screen detected	7 (17.1)	6 (14.6)		3 (10.7)	10 (16.4)	
Symptomatic	6 (14.6)	4 (9.8)		1 (3.6)	10 (16.4)	

[a] Total responses may not exactly match patient numbers because of missing answers.

in hindsight, once patients learned their diagnosis and received treatment, than it had been during the wait for diagnosis. Likewise, regular use of screening tests is based on self-report. We did not assess adherence to screening guidelines, participation in organized compared with ad hoc screening, or duration of participation in screening activities. Patients with better outcomes might have been more likely to volunteer for the study. Moreover, our study examines only two cancer types in one Canadian province.

5. CONCLUSIONS

Regular use of screening tests did not improve wait times for a cancer diagnosis or wait-related satisfaction among breast and prostate cancer patients in Newfoundland and Labrador. Moreover, wait times and satisfaction were poorest among patients who received regular screening tests, but whose cancer was detected because of symptoms rather than because of their screening activities. To our knowledge, this study is one of the first in Canada to examine the relationship between regular use of screening tests, wait time, and wait-related satisfaction. Despite its limitations, it raises novel questions about the impact of screening on the perceptions of patients about health system performance. Further research is needed to explore these findings more robustly and in other cancer patient groups, particularly in areas in which organized screening programs are offered.

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7. CONFLICT OF INTEREST DISCLOSURES

The authors declare that no financial conflict of interest exists.

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