



Cancer

Women's Behaviors Toward Mammogram and Pap Test: Opportunities to Increase Cervical Cancer Screening Participation Rates among Older Women



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ABSTRACT

Objectives: Screening rates for cervical cancer remain moderate among women over 50 years of age. Because cervical and breast screening interventions can be linked, evaluating screening factors relating to both is important. This study evaluates factors associated with breast and cervical screening participation in women aged 52 to 69.

Methods: A cross-sectional study was used to describe characteristics associated with screening behaviors of 1,173,456 eligible women in Ontario, Canada. Overdue for screening was defined as more than 2.5 years from last mammogram or more than 3.5 years from last Pap test. Factors that might influence uptake of mammogram or Pap test were included as covariates in a multivariable multinomial logistic regression model.

Results: Overall, 52.4% of eligible women were up-to-date for both, 21.3% were overdue for both, 14.4% were overdue for Pap test but were up-to-date with mammogram, and 11.9% were overdue for mammogram but were up-to-date with Pap test. There was an opposite effect of age on likelihood of being overdue for Pap test only versus mammogram only. Women aged 67 to 69 compared with those 52 to 54 were more likely to be overdue for Pap test only (adjusted odds ratio, 2.3; 95% confidence interval, 2.3–2.4) and less likely to be overdue for mammogram only (adjusted odds ratio, 0.5; 95% confidence interval, 0.5–0.6). A greater proportion of women rostered to a female physician versus a male physician were up-to-date for both (63.7% vs. 51.5%).

Conclusions: Comparing screening patterns may provide physician- and patient-directed strategies to increase cervical screening participation by recruiting women who are overdue for Pap test but undergoing breast cancer screening.

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The benefit of cervical cancer screening has been undisputed with regard to its key role in preventing cervical cancer. Despite the benefits of screening, cervical cancer screening programs face challenges in achieving desired screening participation rates.

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Conflict of interest statement: The authors have no conflicts of interest to declare.

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In Ontario, there are 4.4 million women eligible for cervical cancer screening, with screening participation rates being higher among younger women and declining with advancing age despite the ongoing risk of cervical cancer in the older age groups. In 2013 through 2015, women aged 50 to 59 and 60 to 69 had screening participation rates of 63.0% and 52.8%, respectively, compared with women aged 30 to 49 and 40 to 49, who had screening participation rates of 64.8% and 65.2% respectively ([Cancer Quality Council of Ontario, 2017a](#)).

The incidence of cervical cancer in Ontario among women aged 50 and over is greater than those younger than age 50, with a rate of 11.9 per 100,000 in women aged 50 and over compared with 9.8 per 100,000 in women under age 50 in 2012. Significantly, the mortality rate from cervical cancer is also greater among older women. In 2010 through 2012, cervical cancer mortality rate among women aged 50 and over was 4.9 per

100,000, whereas the rate for women under the age of 50 was 1.5 per 100,000 (Cancer Care Ontario, 2017).

Participation of women over the age of 50 in cervical screening has a significant impact on the reduction of mortality and morbidity from cervical cancer. A previous study found that participation of older women in cervical cancer screening could reduce cervical cancer incidence by 51% to 66%. Furthermore, it was found that among women aged 55 to 79 years, the odds of cervical cancer death for women screened with Pap test was reduced by 74% compared with unscreened women (Rustagi et al., 2014).

Despite the beneficial impact of screening on reduction of cervical cancer mortality and morbidity especially among women aged 50 and over, the participation rate among women in this age group is low. Therefore, a significant number of women in this age group may not benefit from the protection of screening and are at risk for avoidable cervical cancer deaths. Cervical cancer screening barriers explored in literature include increasing age (Forte, Lockwood, McLachlin, Fekete, & Bryant, 2012), lack of knowledge (Williams, Carter, & Rychetnik, 2014), male physician screener (Lofters, Ng, & Lobb, 2014), presence of chronic diseases (Diaz et al., 2017), and lack of physician recommendation (Mandelblatt & Yabrf, 2000). Opportunities to engage women over the age of 50 to undergo cervical screening must be explored as research focusing on engagement of older women to cervical screening is sparse.

The Ontario Breast Screening Program (OBSP) offers screening services to women aged 50 to 74. In 2014 through 2015, 65.2% of the eligible population for breast cancer screening completed at least one mammogram. Breast screening rates among women aged 50 to 69 years increases with advancing age with participation rates ranging from 62.3% in women aged 50 to 54 to 69.0% in women aged 65 to 69 (Cancer Quality Council of Ontario, 2017b). In women over the age of 50, the breast cancer screening rate is higher than cervical screening; because breast cancer screening rates increases with age, an opportunity may exist to recruit older women who are overdue for a Pap test and presenting for breast cancer screening.

There is a paucity of research on factors associated with women's participation in breast and cervical cancer screening in an organized screening program because a majority of previous research studies have focused on specific subpopulations and factors influencing women's participation in cervical screening only. In addition, previous research studies have mainly focused on cervical screening participation among women in all eligible age groups. Therefore, little is known about the factors associated with screening participation among older women. A better understanding of women's breast and cervical cancer screening behaviors could provide insight for new policies and recruitment strategies.

The purpose of this study was to evaluate factors associated with mammogram and Pap test uptake among women aged 52 to 69 eligible for both breast and cervical cancer screening programs in a large, population-based setting.

Methods

Study Setting and Design

This study was conducted in Ontario, Canada, a province with more than 13 million residents. A cross-sectional approach was used to describe demographic, socioeconomic, geographic, and physician characteristics associated with women's breast and cervical cancer screening behaviors among all women eligible for both screenings as of July 1, 2015.

Study Population

All Ontario women aged 52 to 69 years eligible for breast and cervical cancer screening according to the Ontario Cervical Screening Program and OBSP guidelines (Cancer Care Ontario, 2016). Women under age 52 were not included because 52 is the minimum age at which someone can be overdue for breast or cervical cancer screening. Women were included if they have never received an invasive cervical or breast cancer diagnosis and have not had a hysterectomy or mastectomy in the past. Women who underwent a colposcopy for a cervical dysplasia within the previous 3 years and women diagnosed as being at high risk for breast cancer were excluded (Figure 1).

Data Sources

Administrative data included in the study is representative of health services used by all Ontario residents. The Registered Persons Database was used for age, sex, residential postal code, and vital statistics for all residents with a valid Ontario Health Insurance Plan number. The Integrated Client Management System database was used to identify mammograms completed within the OBSP and to identify women at high risk for breast cancer. Cytobase, which is a centralized cervical cytology database, was used to identify Pap tests completed within the Ontario Cervical Screening Program. The Ontario Health Insurance Plan's Claims History databases was used to identify non-Ontario Cervical Screening Program Pap, non-OBSP mammogram, hysterectomy, mastectomy, and colposcopy claims. The Ontario Cancer Registry and Pathology Information Management System were used to identify invasive cervical and breast cancer cases. The Client Agency Program Enrolment database and Corporate Providers Database were used to identify patients and physicians information. The Canadian Institute of Health Information Discharge Abstract Database and National Ambulatory Care Reporting System were used to obtain diagnostic codes (*International Classification of Diseases*, 10th edition, version) data from all Ontario hospital discharges and ambulatory care visits to identify women with chronic conditions. All datasets were linked using unique personal health identification number at the individual level. The Postal Code Conversion File plus Version 6C was used to generate residence and geographical variables (Statistics Canada, 2017).

Ethics

Cancer Care Ontario is designated a "prescribed entity" for the purposes of section 45(1) of the Personal Health Information Protection Act of 2004. As a prescribed entity, Cancer Care Ontario is authorized to collect personal health information from health information custodians without the consent of the patient, and to use such personal health information for the purpose of analysis or compiling statistical information with respect to the management, evaluation, or monitoring of the allocation of resources to or planning for all or part of the health system, including the delivery of services. Because this study is in compliance with privacy regulations, ethics review was not required.

Outcome

The outcome consisted of four mutually exclusive categories including "up-to-date for both," "overdue for Pap test only," "overdue for mammogram only," or "overdue for both" measured by time since most recent screening test for all eligible

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