Gender Differences in Cancer Mortality Risk Perceptions and Screening Behaviors among Adults 40-60 Years of Age

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The purpose of this study was to examine gender differences in cancer mortality risk perceptions and preventive screening behaviors as well as perceptions of gender differences in types of cancer risks. A telephone survey was administered to 300 men and 300 women between 40 and 60 years of age, all of whom were contacted via a random digit dialing procedure. Findings showed that 62% of respondents believed that prostate cancer was the most frequent cause of cancer mortality among men (12% actual) while breast cancer was thought to be the most frequent cause reported among 80% of women (17% actual). It was determined that 79% of men and women are discussing or receiving preventive screening for prostate and breast cancer, respectively, and that these frequencies increase significantly after age 50. Finally, most respondents believed that women had higher rates of cancer morbidity and mortality than men. These results suggest that an increase in cancer mortality risk awareness is needed among both men and women. The elevated risks among men need to be made salient, and prevention campaigns that target men’s mortality risks need to be developed.

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Cancer is currently a leading cause of death among Canadians. According to the National Cancer Institute of Canada (NCIC), the 2004 age-standardized incidence rates for cancer were 449 per 100,000 men and 351 per 100,000 women (NCIC, 2004). The most frequently diagnosed cancer for men was prostate cancer (121/100,000) while the most frequently diagnosed cancer for women was breast cancer (106/100,000). The average treatment success rate for both of these cancer types is high. As a result, for both males and females the most frequent cause of death from cancer was lung cancer (65/100,000 for men; 40/100,000 for women). The mortality rates for prostate and breast cancers were close to half these estimates (27/100,000 and 24/100,000, respectively).

The NCIC statistics also show that, once women’s greater longevity is taken into account, men are not only more likely to get cancer, but they are also more likely to die from it. That is, men are 28% more likely than women to be diagnosed with cancer, but of those diagnosed, men are 47% more likely than women to die from cancer (NCIC, 2004). These gender differences in morbidity and mortality have been stable since at least 1969 (NCIC, 1998).

Although lung cancer is the leading cancer-related cause of death in Canada, most media and research attention is devoted to breast cancer and, more recently, prostate cancer. Given the widespread focus on these two types of cancer, social science theories of media influence such as the Cultivation Hypothesis (Gerbner, Gross, Morgan, & Signorielli, 1994; McCreary, 1997; McCreary & Sadava, 1999) predict that people should overestimate men’s likelihood of dying from prostate cancer and women’s likelihood of dying from breast cancer. Furthermore, because the media focus on prostate cancer is relatively new and also because there has been a relative absence of men in the social marketing campaigns for cancer prevention, these theories also predict that people will believe women are at greater risk than men for being diagnosed with cancer and experiencing a cancer-related death.

Early detection is seen as important for reducing cancer mortality. The two keystones to ensuring early detection are awareness and screening. This is especially important for middle-aged men and women, since this is the time when risk increases and, consequently, most will begin to submit to more extensive screening by their physicians (Feightner, 1994; Morrison, 1994). However, there are differing opinions about when preventive screening should begin. The Canadian Task Force on Preventive Health Care (CTFPHC) does not recommend regular, preventive prostate cancer screening (Feightner, 1994) because the scientific evidence has not been compelling enough (e.g., Meyer & Fradet, 1999; Partin & Wilt, 2002). On the other hand, the Canadian Cancer Society (2004a) recommends that men begin discussing prostate cancer screening with their physicians beginning at age 50. For women, the Canadian Cancer Society recommends regular breast self-examination (BSE) from age 20 onward, discussing mammograms with their physicians at age 40, and undergoing mammography every two years beginning at 50 (Canadian Can-
The recommendations from the CTFPHC are almost identical to the Canadian Cancer Society policy, with one exception: the CTFPHC notes that the scientific evidence suggests that BSE is not effective and, therefore, does not promote its use (Morrison, 1994).

Awareness of cancer risk should lead to an increased focus on screening, including either actual physical tests or discussions with a physician about the practicality of screening. Because of the focussed media attention on prostate and breast cancers, both men and women are likely to be actively engaged with their physicians in either talking about screening or being screened. Similarly, because physician guidelines (i.e., CTFPHC) and patient information sources such as the Canadian Cancer Society both recommend screening after 50, there should be an increase in screening or screening discussions after this age.

The purpose of this study was to explore cancer risk perceptions, perceptions of gender differences in cancer risks, and prostate and breast cancer screening behaviour in men and women between 40 and 60 years of age. We explored four related hypotheses. (1) When asked the type of cancer from which men and women are most likely to die, respondents will overestimate men’s likelihood of dying from prostate cancer and women’s likelihood of dying from breast cancer. (2) Many men and women will have discussed prostate or breast cancer screening with their physicians, although this number should be higher in those over 50 years old. (3) When asked which gender is at greater risk for being diagnosed with and dying from cancer, respondents will be more likely to say that women are at greater risk. (4) When asked whether women are more likely to die from breast cancer than men die from prostate cancer, participants will be more likely to agree with this statement.

METHODS

PROCEDURE

A national survey organization conducted 600 telephone interviews during June and July of 2003. All respondents were contacted via a random digit dialling procedure. If the person who answered the telephone was not between 40 and 60 years of age, he/she was asked whether there was anyone in the household in that age group. Most interviews (70%) were conducted after 5 p.m. The interviews were conducted using a Computer-Assisted Telephone Interview (CATI) system and took between four and 19 minutes to complete (M = 7.63, SD = 1.88). The completed interviews represent a 43% response rate (i.e., 1390 valid contacts, 790 refusals).

PARTICIPANTS

All respondents (300 men and 300 women) were Ontario residents, between 40 and 60 years of age. Twelve percent of respondents lived in the Greater Toronto Area (GTA), 24% lived in the more suburban outer GTA, 27% resided in other areas of Southern Ontario, 16% lived in Eastern Ontario, 18% resided in Central Ontario, and 3% lived in Western Ontario. A more detailed description of the sample is provided in Table 1. Gender differences in these characteristics were examined using $\chi^2$
No significant gender differences emerged for age or marital status. With regard to employment status, men were more likely to be employed full-time, while women were more likely to be employed part-time, $\chi^2 (5, n = 599) = 51.91, p < .001$. Weight status differed significantly as a function of gender, $\chi^2 (3, n = 585) = 26.33, p < .001$, such that women were more likely to be at normal weight while men were more likely to be overweight or obese. There also was a significant gender difference in perceived health, $\chi^2 (2, n = 599) = 6.29, p < .04$. Men and women were fairly equally represented in the poor/fair health or very good/excellent health categories, while more men than women rated their health as “good.”

<table>
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<tr>
<th>Characteristics</th>
<th>Total $N = 600$</th>
<th>Men $n = 300$</th>
<th>Women $n = 300$</th>
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<td>53</td>
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<tr>
<td>50-60</td>
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<td>72</td>
<td>71</td>
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<tr>
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<td>10</td>
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<tr>
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<td>1</td>
<td>4</td>
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<tr>
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<tr>
<td>Employed part-time</td>
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<td>14</td>
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</tr>
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<td>1</td>
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<td>1</td>
<td>2</td>
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<tr>
<td>Normal Weight (BMI 18.5-24.9)</td>
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<td>Overweight (BMI 25 to 29.9)</td>
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<tr>
<td>Obese (BMI &gt;30)</td>
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<td>19</td>
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<tr>
<td><strong>Perceived Health</strong></td>
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<tr>
<td>Good</td>
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<td>35</td>
<td>25</td>
</tr>
<tr>
<td>Very Good/Excellent</td>
<td>55</td>
<td>51</td>
<td>60</td>
</tr>
</tbody>
</table>

Note: BMI: Body Mass Index.
The following questions were used to assess cancer perceptions and awareness as well as screening behaviors. All questions were read to respondents in the same manner, using the CATI system to provide the script and prompts.

*Cancer Mortality Perceptions.* Respondents were asked to indicate (1) which type of cancer causes the most deaths among men and (2) which type of cancer causes the most deaths among women. For both questions, no prompts were given.

*Prostate and Breast Cancer Screening Behaviors.* To determine the extent to which men and women are engaged with their family physician in screening for prostate and breast cancers, two questions were posed. For men, we asked: “Have you ever been screened for prostate cancer or discussed prostate screening with a doctor?” For women, we asked: “Have you ever had a mammogram or discussed mammograms with a doctor?” For both questions, a *yes* or *no* response was solicited.

*Perceived Gender Differences in Cancer Morbidity and Mortality.* Respondents were asked to rate their level of agreement with the following three questions about gender differences in cancer mortality risks. (1) More men are diagnosed with cancer than are women. (2) Men who are diagnosed with cancer are *less* likely than women to die within five years. (3) More Canadian women are diagnosed with breast cancer than men are diagnosed with prostate cancer. (The first question is true, while the second and third questions are false [NCIC, 2003].) Responses to each question were made on a five-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (5).

**RESULTS**

**CANCER MORTALITY PERCEPTIONS**

Responses to the questions asking about the type of cancer that Canadian men and women were most likely to die from can be found in Table 2. Respondents gave a wide range of responses that included nine different cancer types for men and seven different cancer types for women. However, as Table 2 shows, both men and women overestimated the frequency with which men die of prostate cancer and women die of breast cancer. Overall, 62% of respondents believed that men’s greatest cancer mortality risk came from prostate cancer. However, for the year in which the survey was completed, prostate cancer was ranked third in men’s cancer mortality (after lung and colorectal cancers), and represented only 12% of men’s cancer deaths (NCIC, 2003). A similar pattern of findings emerged for breast cancer: 80% of respondents believed that breast cancer was the most frequent cancer-related cause of mortality for women, whereas it was ranked second in the 2003 statistics (after lung cancer) and represented only 17% of women’s cancer deaths.
As a supplemental question, we sought to determine whether men and women differed in their overestimation of men’s risk of dying from prostate cancer and women’s risk of dying from breast cancer. Because of the free-response nature of the two questions asked here, we created a two-category proxy variable for each. For the men’s mortality question, the two categories were prostate cancer and other cancer. For the women’s mortality question, the two categories were breast cancer and other cancer. Two 2 (Gender) x 2 (Cancer Category) chi-square analyses were then conducted. For perceptions of men’s cancer mortality, women (58%) were significantly more likely than men (42%) to believe that prostate cancer was the leading cause of men’s cancer-related mortality, $\chi^2 (1, n = 572) = 22.62, p < .001$. There were no significant gender differences in respondents’ estimates of women’s likelihood of dying from breast cancer (Men = 51%, Women = 49%; $p > .05$).
Overall, 65% of men noted that they either had discussed prostate cancer screening with their physician or had undergone screening for prostate cancer. Seventy-nine percent of women reported that they had either discussed having a mammogram with their physicians or had received a mammogram. In order to compare men’s and women’s screening behaviours, we collapsed the responses to these two questions and conducted a chi-square goodness of fit test. The findings showed that women were significantly more likely to have discussed or undergone breast cancer screening than men were to have discussed or undergone prostate cancer screening, $\chi^2 (1, n = 595) = 15.59, p < .001$. Because of the importance of age 50 in the Canadian Cancer Society screening guidelines, two chi-square goodness of fit tests were used to determine whether (1) more men over 50 were discussing or undergoing screening for prostate cancer, compared to men under 50, and (2) more women over 50 were discussing or undergoing screening for breast cancer (i.e., mammograms), compared to women under 50. For men under 50, 49% had discussed or experienced prostate screening with their physician; for those 50 and older, however, the number was significantly higher (80%), $\chi^2 (1, n = 297) = 29.53, p < .001$. For women under 50, 68% had discussed or undergone mammography, while for women 50 and older, 92% had done so, $\chi^2 (1, n = 298) = 26.28, p < .001$.

For each of the three questions asked about perceived gender differences in cancer morbidity and mortality, we felt that collapsing the five-level responses into three categories (Strongly Agree/Agree, Neither Agree Nor Disagree, Disagree/Strongly Disagree) and analysing the data using chi-square analyses was more meaningful than exploring mean differences in responses. In other words, because each of the statements is empirically either true or false, we wanted to know the degree to which the respondents agreed with the one true statement and disagreed with the two untrue statements as well as whether male and female respondents differed in their agreement. The rates of agreement and disagreement to each question can be found in Table 3.

For the item asking whether men are more likely than women to be diagnosed with cancer, a chi-square goodness of fit test showed that a significantly greater number of the respondents disagreed with this true statement than would be expected by chance alone, $\chi^2 (2, n = 565) = 100.15, p < .001$. When we explored gender differences in responses to this statement using a 2 (Gender) x 3 (Agreement Categories) chi-square test, we observed that women were significantly more likely than men to disagree with this true statement, $\chi^2 (2, n = 565) = 10.89, p < .01$. For the statement that men who are diagnosed with cancer are more likely than women to survive the first five years of their cancer, a significantly greater number of the respondents disagreed with this false statement than would be expected by chance alone, $\chi^2 (2, n = 568) = 42.01, p < .001$. Men and women did not differ significantly in their responses to this statement ($p > .05$). The third statement asked respondents whether they agreed with the statement that more women are diagnosed with breast cancer than...
Significantly more respondents agreed with this false statement than would be expected by chance alone, $\chi^2 (2, n = 566) = 226.24, p < .001$. There were no significant gender differences in responses to this item ($p > .05$).

**DISCUSSION**

The findings from the present study support our four cultivation hypothesis-derived research questions regarding cancer-related risk misperceptions in middle-aged men and women. The first two hypotheses stem from the wide-ranging media attention devoted to breast cancer among women and prostate cancer among men. Our first prediction, that men and women would overestimate men’s likelihood of dying from prostate cancer and women’s likelihood of dying from breast cancer, was supported. Sixty-two percent of our respondents thought that prostate cancer was the leading type of cancer death among men, while 80% of respondents thought that breast cancer was the leading cancer-related cause of death among women. However, in 2003, this was not the case. Prostate cancer accounted for only 12% of men’s cancer deaths, and breast cancer accounted for only 17% of women’s cancer deaths (NCIC, 2003).
Our second prediction was that men and women would be discussing or have had their physicians conduct prostate screening or mammography, and that a greater percentage of men and women should be doing so after age 50. These predictions were supported. However, what serves as evidence for the greater salience of these types of cancer in men’s and women’s minds is the finding that 49% of men under 50 and 68% of women under 50 have either discussed screening with their physician or have undergone a screening procedure. The figures for men are even more surprising since there is medical uncertainty about the usefulness of prostate cancer screening (Meyer & Fradet, 1999). Thus, while we would expect a certain percentage of men and women to be discussing or undergoing screening, the numbers seem exceptionally high and suggest that the social salience of these two types of cancer may be associated with this extra degree of vigilance.

Our second set of hypotheses, which addressed perceptions of gender differences in cancer risk, were supported. That is, respondents did not know that men are more likely than women to suffer from cancer. They also were more likely to believe, inaccurately, that breast cancer incidence is more prevalent among women than prostate cancer is among men. Their responses to the question about men’s and women’s five-year cancer mortality were somewhat more accurate. However, there is the possibility that these findings were a result of the awkward wording of the statement. Therefore, future research needs to reexamine people’s beliefs about men’s and women’s cancer mortality.

In addition to the hypothesized findings, the gender differences we observed in these misperceptions also are notable. That is, women were more likely to overestimate men’s prostate cancer mortality risks but minimize men’s overall rates of prevalence. Given that women are often the gatekeepers for men’s health-protective behaviours (including scheduling physician appointments and screenings) (Courtney, 2003; International Longevity Center—USA Interdisciplinary Workshop Group, 2004; Meryn & Jadad, 2001), this gender difference may contribute to men’s greater focus on prostate cancer risks than on risks from other cancer types.

To what extent do the cancer misperceptions reported in this study have relevance for the real world of cancer care? First, with regard to the finding that most men and women are discussing prostate and breast cancer screening with their physicians, an important point to consider is whether this discussion is being initiated by the respondents themselves or by their physicians. If the conversations are not being initiated by the physicians, then the question of patient motivation becomes important. For example, are people asking their physicians about screening because they have an inflated idea about their personal risk for having the disease as well as from dying from it (i.e., confusing morbidity with mortality)? This is especially important for women, who, in addition to having an elevated perception of their risk of dying from cancer, also appear to underestimate their risk of dying from cardiovascular disease, even though it is the leading cause of death among North American women (Grace, Fry, Cheung, & Stewart, 2004; Mosca et al., 2001).

Patient motivation aside, however, women are still being screened at significantly higher rates than men. The extent to which this is a function of the CTFPHC physician screening guidelines or men’s typically low levels of healthcare involvement (Courtney, 2003) needs to be determined.
Our findings also suggest that further investigation into current Canadian cancer research and services is warranted. A cursory glance shows that funding for breast cancer research, prevention, or support programs far outstrips those provided for any other type of cancer. Next in line for attention (although still small in comparison, but growing) has been prostate cancer. Other questions that need to be asked include, but are not limited to, the following: Why are gender-specific cancers like breast and prostate receiving more interest than other common cancers while, at the same time, there has there been so little concentrated focus on lung, colorectal, or pancreatic cancers? Why is there more attention to women’s cancers than to men’s, and could this be related to factors such as age-at-diagnosis and women’s parenting roles at this life stage? Is health care policy and spending being influenced primarily by human need, or are we acting on widely shared misperceptions, fuelled by strong special interest advocacy, successful marketing strategies, and gender politics? Finally, what are the implications of our findings for other heath care systems in other parts of the Westernized world. Answers to these questions have important implications for all levels of the Canadian health care system.

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