Estimation of Breast Cancer Risk by Women Aged 40 and Over: A Population-based Study

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ABSTRACT

Objective: Identify factors associated with knowledge of breast cancer and estimation of risk.

Methods: Telephone survey of 412 women aged 40 and over, living in Montreal and selected by random digit dialing.

Results: The majority of the respondents had recently been exposed to some information on breast cancer, but only a third quoted the average lifetime probability estimate of about 1 in 10. Older individuals systematically considered themselves at low risk (odds ratio (OR) of perceiving risk as lower than average for women aged 50 or over versus under 50: 2.6, 95% confidence interval: (1.5,4.6)). In addition, both a first-degree family history of breast cancer (OR: 5.3 (1.7,17.0)) and a recent mammogram (OR: 3.0 (1.4,6.2)) were strongly associated with a woman's probability of perceiving herself at high risk.

Conclusions: Information campaigns should emphasize the frequency of breast cancer in different age groups and the strength of the established associations with specific risk factors. Better knowledge of risk could promote sustained participation in breast screening programs.

ABRÉGÉ

Objectif : Identifier les facteurs associés à la connaissance du cancer du sein et à la perception du risque de cette maladie.

Méthode : Entrevue téléphonique auprès de 412 femmes âgées de 40 ans ou plus, résidant à Montréal et sélectionnées de façon aléatoire.

Résultats : La majorité des répondantes avaient été exposées récemment à de l'information concernant le cancer du sein, mais seulement le tiers d'entre elles connaissaient la probabilité moyenne de cette maladie au cours de la vie, environ 1 sur 10. Les femmes plus âgées se considéraient systématiquement à faible risque (rapport des cotes (OR) de se percevoir à faible risque pour celles de 50 ans ou plus versus celles de moins de 50 ans: 2,6, intervalle de confiance à 95 %: (1,5, 4,6)). De plus, une histoire de cancer du sein chez une parente au premier degré (OR: 5,3 (1,7, 17,0)) et une mammographie récente (OR: 3,0 (1,4, 6,2)) étaient fortement associées à la probabilité de se considérer à risque élevé.

Conclusions : Les campagnes d'information devraient faire connaître la fréquence du cancer du sein dans différents groupes d'âge et la force des associations démontrées avec des facteurs de risque spécifiques. Une meilleure connaissance du risque est susceptible de stimuler la participation soutenue au dépistage.

Several conceptual models have been used to study the determinants of health behaviours, the most common being the Health Belief Model.[1] A review of studies using this model revealed that perceived susceptibility to illness, one of the constructs of the model, is among the strongest predictors of preventive health behaviours.[2]

Few studies describe women's perceptions of their own susceptibility to breast cancer, their knowledge of the average lifetime risk for women in general, as well as the determinants of these estimations. Evans et al.[3] used probability estimates from the Cancer and Steroid Hormone Study[4] to assess the risk of women referred to a breast cancer family history clinic in the United Kingdom. Only 11% of the sample chose the correct population risk estimate of 1 in 12 at the time, whereas 41% underestimated and 47% overestimated it. More than half of the women could not assess their own risk within 50% of the clinician's estimate. Similarly, Lerman et al.[5] conducted a randomized trial of risk counselling among first-degree relatives of breast cancer patients and compared subjective to objective risk estimates obtained with the Gail et al. model.[6] In both study groups, two thirds of the women continued to overestimate their risk of breast cancer three months after the intervention. Overestimation of personal risk was also observed among women aged 40 to 50 years attending a preventive practice.[7] The probability of dying from breast cancer within the next 10 years was overestimated more than 20-fold and the probability of developing breast cancer within the same timeframe almost 6-fold. Women having more education and numeracy, or ability with the estimation of probabilities in general, were less likely to overestimate their risk of developing or dying from breast cancer.

In the process of planning a population-based breast screening program for the region of Montreal, we conducted a survey assessing current knowledge of breast cancer as well as screening practices. We used data from this survey to identify factors associated with risk estimation and to target areas of information about early cancer detection.

MATERIALS AND METHODS

Study population

The study population included noninstitutionalized women aged between 40 and 69 years, free from breast cancer and living in the Montreal area. Study participants were selected by random digit dialing. Out of 4,145 telephone numbers, 2,206 were residential. Among the 476 eligible women who were contacted, 412 completed the interview. The response rate, calculated as the sum of the non-eligible and the completed interviews divided by an estimate of all usable telephone numbers, was estimated at 72%.

Data collection

Interviews were conducted between January 15 and January 25, 1995. Questions concerned sociodemographic

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characteristics and risk factors for breast cancer, perception of health as well as of personal risk of breast cancer, knowledge of the average lifetime probability estimate of the disease, exposure to information on breast cancer within the last month, and habits of breast self-examination (BSE), breast examination by a health professional (CBE) and use of mammography. The reasons given for having the first mammogram indicated that more than two thirds were done for screening purposes. Options for the estimation of the average lifetime risk were 1/2, 1/5, 1/10, 1/25 and 1/100. In order to be consistent across categories of response, the proportion 1/10 was used instead of 1/9, the average risk in Canada at the time of the survey, judged likely to systematically attract attention. Women were asked to indicate if they considered themselves at much higher, higher, comparable or lesser risk of breast cancer than other women of their age.

Data analysis

For each participant, a risk factor score was calculated as the sum of the following characteristics: age over 50 years, a first-degree family history of breast cancer, a history of benign breast disease with or without biopsy, menarche at age 11 or earlier, menopause at age 50 or over, and a first childbirth after age 30. The maximum possible score was six for women over age 50 years and four for younger participants.

Odds ratios (OR) of the association between each variable and perception of either average lifetime risk or of personal risk as being higher or lower than the reference category of adequate or average risk, adjusted for age and education, were calculated by logistic regression. For example, an odds ratio of 2 between perception of personal risk as lower than average and a specific risk factor can be interpreted as a twofold probability for individuals with this risk factor of perceiving their personal risk of breast cancer as low. An odds ratio of 1 means lack of association between risk estimation and a characteristic. We chose not to adjust for income because of the high proportion of missing information on this variable (26%).

Polychotomous logistic regression was used to model perception of risk, either populational or personal. This analytic

technique is particularly useful to contrast risk factors across multiple categories of a given outcome.[8] As a first step, two series of simple logistic regression analyses were conducted for each type of risk (populational or personal), one modelling the perception of risk as high, the second contrasting the perception of risk as low, both using the adequate or average risk category as reference. Independent variables included the risk factor score, each of its individual components, recent information on breast cancer, general health perception, and practice of BSE (at least once a

month), CBE (one examination in the last year) and mammography (one mammogram in the last two years). As a second step, variables significantly associated with the perception of each type of risk as lower or higher than average were included in a final polychotomous regression model. This model produced estimates with slightly smaller standard errors. A significance level of 5% was used and hypothesis testing was two-sided. Only results of the final polychotomous regression model are presented here. Analyses were conducted using the BMDP software, version 7.0.

TABLE I
Description of Study Population

Characteristics	Number of Cases % (n)	Estimate of Population Risk			Estimate of Personal Risk		
		Too low %	Correct %	Too high %	Low %	Average %	High %
Age (years)							
40 - 49	44 (180)	17	33	42	28	47	20
50 - 69	56 (228)	14	31	39	41	34	15
Marital Status							
Married/with spouse	66 (270)	15	33	39	34	38	19
Others	34 (140)	16	32	43	38	42	12
Occupation							
Student/active	54 (220)	18	37	36	32	42	20
Others	46 (190)	13	27	44	40	36	14
Education							
12 years or less	56 (229)	17	27	42	39	37	15
13 years or more	44 (179)	13	41	37	30	44	19
Risk Factor Score							
0	24 (84)	13	36	44	25	54	15
1	40 (140)	15	32	40	39	32	19
2	25 (86)	17	33	36	40	34	20
3	10 (33)	18	39	33	36	48	15
4	1 (31)	33	33	33	33	33	33
Perception of Health							
Average	39 (159)	16	27	38	30	37	20
Excellent, very good	57 (236)	14	36	42	40	41	14
Poor	4 (15)	27	20	40	27	27	40
Exposure to Information About Breast Cancer							
Yes	69 (258)	14	34	40	33	43	19
No	31 (118)	17	32	39	42	34	12
Previous Teaching of BSE							
Yes	86 (352)	15	34	39	36	40	17
No	14 (59)	15	24	44	32	37	15
Regular Practice of BSE							
Yes	48 (193)	12	39	39	37	37	22
No	52 (206)	19	26	41	35	41	12
CBE in the Last Year							
Yes	54 (224)	14	34	41	33	41	20
No	46 (188)	17	30	39	38	37	14
Mammogram in the Last Two Years							
Yes	52 (206)	16	35	37	34	37	22
No	48 (188)	14	30	44	39	43	10
TOTAL		15	33	40	35	39	17

Note: Sub-totals may differ from 100% due to missing data

TABLE II

Associations Between Knowledge of Average Lifetime Risk of Breast Cancer and Selected Respondents' Characteristics

Characteristics	Lower Than 1 in 10 OR (95% C.I.)*	Higher Than 1 in 10 OR (95% C.I.)*
Age over 50 years	0.9 (0.5,1.6)†	1.0 (0.6,1.6)†
Higher education	0.6 (0.3,1.1)‡	0.7 (0.4,1.2)‡
Risk factor score of 2 or more	1.5 (0.7,3.4)	0.8 (0.4,1.4)
Perception of health as :		
- Excellent, very good	0.7 (0.4,1.3)	0.9 (0.5,1.4)
- Poor	2.1 (0.4,10.8)	1.2 (0.3,5.6)
First-degree family history	0.6 (0.2,2.2)	0.8 (0.3,1.9)
Previous benign breast disease	1.1 (0.5,2.3)	0.5 (0.3,1.0)**
Late menopause	0.9 (0.3,2.7)	1.0 (0.5,2.3)
Early menarche	1.5 (0.7,3.1)	1.1 (0.6,2.1)
Nulliparity	1.6 (0.7,3.5)	1.0 (0.5,1.9)
Late first pregnancy	2.3 (1.0,5.6)	0.9 (0.4,2.0)
Previous information on breast cancer	0.8 (0.4,1.6)	1.0 (0.6,1.7)
Regular practice of BSE	0.4 (0.2,0.8)**	0.7 (0.4,1.1)
CBE in the last year	0.7 (0.4,1.4)	0.9 (0.6,1.5)
Mammogram in the last two years	1.0 (0.5,1.9)	0.7 (0.5,1.2)

* Odds ratio (95% confidence interval), adjusted for age and education
** p < 0.05
† Adjusted for education only
‡ Adjusted for age only
Note: Reference category is adequate estimate of average lifetime risk

TABLE III

Associations Between Estimation of Personal Risk and Selected Respondents' Characteristics

Characteristics	Risk Lower Than Average OR (95% C.I.)*	Risk Higher Than Average OR (95% C.I.)*
Age over 50 years	2.0 (1.3,3.2)†**	1.0 (0.6,1.8)†
Higher education	0.8 (0.5,1.2)‡	1.3 (0.7,2.2)‡
Risk factor score of 2 or more	0.7 (0.4,1.3)	1.1 (0.5,2.3)
Perception of health as :		
- Excellent	1.4 (0.8,2.2)	0.6 (0.3,1.1)
- Poor	1.1 (0.2,4.8)	3.0 (0.7,11.9)
First-degree family history	0.4 (0.1,1.3)	3.7 (1.5,9.2)**
Previous benign breast disease	0.4 (0.2,0.8)**	1.6 (0.8,3.2)
Late menopause	0.9 (0.4,2.0)	0.8 (0.3,2.4)
Early menarche	1.2 (0.7,2.1)	0.5 (0.2,1.2)
Nulliparity	1.0 (0.5,1.9)	1.5 (0.7,2.9)
Late first pregnancy	1.8 (0.9,3.6)	0.8 (0.3,2.2)
Previous information on breast cancer	0.6 (0.4,1.0)	1.3 (0.6,2.6)
Regular practice of BSE	1.2 (0.7,1.8)	2.0 (1.1,3.6)**
CBE in the last year	0.8 (0.5,1.3)	1.3 (0.7,2.2)
Mammogram in the last two years	0.9 (0.6,1.5)	2.8 (1.5,5.4)**

* Odds ratio (95% confidence interval), adjusted for age and education
** p < 0.05
† Adjusted for education only
‡ Adjusted for age only
Note: Reference category is estimate of personal risk as average

RESULTS

Study population

The study population is described in Table I. Over 40% of the respondents (180) were aged between 40 and 49 years. More than half (56%) had 12 or fewer years of education. As compared with data from the 1991 Canadian census for the Montreal area, the sample included a slightly larger proportion of women aged 40 to 49, as well as of women living with a spouse or active outside the home (data not shown).

The average risk factor score for breast cancer was 1.22, ranging from 0 to 4. More specifically, 7% had a first-degree family history of breast cancer, 14% had a history of benign breast disease and almost a fifth had their menarche before age 12. In addition, 14% had their first pregnancy after age 30 years and 16% were nulliparous. Finally, 10% of women aged 50 years or more were still premenopausal.

The majority (58%) of these women perceived their health as excellent or very good and only 4% as poor. Most had been

taught BSE (86%). Breast cancer screening was very prevalent in this group. About three quarters of the women practised BSE, 48% at least once a month. The majority (93%) had had a previous breast examination by a health practitioner, 54% in the last year. Finally, 78% reported at least one previous mammogram, 52% in the last two years.

Estimation of breast cancer risk

The majority of these women (69%) had been exposed to some information about breast cancer in the last month. Despite this, only about a third of the respondents (37%) quoted the correct average lifetime probability estimate of 1 in 10 (or 1 in 9). Many women (46%) overestimated that risk and only 17% underestimated it.

By contrast, the majority of the subjects considered themselves to be at similar (43%) or lower (39%) risk of breast cancer than other women of their age. Only 19% perceived themselves at higher risk than average.

There was no association between perception of personal risk and estimation of the population lifetime risk of breast cancer (chi-square with 2 degrees of freedom: 6.148, p=0.2).

Factors associated with risk estimation

Tables II and III describe the associations of several personal characteristics with the perception of risk as being above or below the average reference category.

Women having a history of benign breast disease were less likely to report an excessive estimate of the average lifetime risk (OR: 0.5 (0.3,1.0)). Since this association is adjusted for age and education, it cannot be explained by the confounding effect of these two factors. Similarly, women practising BSE at least once a month were more likely to display adequate knowledge (OR: 0.4 (0.2,0.8) for low estimate, 0.7 (0.4,1.1) for high estimate). Other personal characteristics had little influence on knowledge of the average risk, although educated women were less likely to report an inaccurate probability.

Concerning the personal risk of breast cancer, older women tended to consider themselves at low risk (OR: 2.0 (1.3,3.2)).

In addition, women reporting previous benign breast problems were less likely to perceive their risk as low (OR: 0.4 (0.2,0.8)) and more likely to consider themselves at high risk (OR: 1.6 (0.8,3.2)), although this latter association did not reach statistical significance. The factors most strongly associated with the perception of one's risk as being higher than average were a first-degree family history of breast cancer (OR: 3.7 (1.5,9.2)), regular practice of BSE (OR: 2.0 (1.1,3.6)) and having had a mammogram in the last two years (OR: 2.8 (1.5,5.4)).

Although women with a risk factor score of 2 or more had fewer chances to consider themselves at low risk and conversely, were slightly more likely to believe themselves at increased risk of breast cancer, these associations failed to reach significance. Again, recent exposure to information about breast cancer did not influence risk assessment in any systematic way. Finally, individuals who perceived their health as excellent had a more optimistic view of their risk of breast cancer. By contrast, those who considered their health as poor were also more likely to think of themselves as being at greater risk.

The polychotomous regression analyses modeled perception of populational risk or of personal risk as the outcomes and as independent variables, factors that were identified as significant in simple logistic regression analyses.

Practising BSE at least once a month was associated with a decreased likelihood of quoting a wrong estimate of the average lifetime probability of breast cancer (OR: 0.3 (0.1,0.6) for estimate lower than 1 in 10; 0.6 (0.3,1.0) for estimate higher than 1 in 10). In addition, nulliparous women appeared more likely to underestimate this risk (OR: 2.6 (1.1,6.2)), although this factor was not significantly associated with an overestimation of risk (OR: 0.9 (0.4,2.0)).

The final polychotomous regression model for the estimation of personal risk revealed that risk factors associated with a woman's perception of her risk as being high were quite different from those associated with perception of risk as below average. Older women were almost three times as likely to perceive themselves at low risk of breast cancer (OR: 2.6 (1.5,4.6)). By contrast, a history of benign breast disease decreased the likelihood of perceiving risk as lower than average (OR: 0.4 (0.2,0.8)). Women with breast cancer in a first-degree relative were almost five times as likely to think of themselves as being at increased risk for this disease (OR: 5.3 (1.7,17.0)). A similar trend was observed in those reporting a recent mammogram (OR: 3.0 (1.4,6.2)).

DISCUSSION

This study suggests that despite the unprecedented public attention recently devoted to breast cancer, women still need to be better informed about the probability of developing this disease and about the importance of some risk factors, especially age.

Most respondents overestimated the average lifetime risk of breast cancer. This is typical of perceptions of highly publicized events.[9,10] This was true independently of their age or prior exposure to information on breast cancer. Better-educated women were more likely to display adequate knowledge. Women who practised breast self-examination were less likely to report an inaccurate probability estimate. This is suggestive of a general pattern of health awareness correlating knowledge and behaviours related with breast cancer.

The majority of the respondents considered themselves at average or low risk of breast cancer as compared to other women of their age. This is consistent with the skewed risk factor score distribution observed in this randomly selected population. Except for a family history of breast cancer, a woman's perception of her own risk was poorly associated with the presence of other specific risk factors for this disease. Several studies have indeed emphasized the high prevalence of preoccupation with breast cancer and related anxiety among relatives of breast cancer patients.[11,12] Still, family history has not been consistently shown to promote preventive behaviours.[12-17]

As compared with women less than 50 years old, older women systematically considered themselves at low risk. Mah et al.[18] reported a similar misapprehension of the importance of age and poor knowledge of risk factors for breast cancer among older respondents in a telephone survey in Alberta. Recent data from the National Health Interview Survey also showed that only 16% of women age 75 or older are aware that age is a risk factor for breast cancer.[19]

Our data suggest that women who engage in screening by mammography are more likely to consider themselves at high risk, independently of their family history of breast cancer. Bondy et al.,[20] using data from the Texas Breast Screening Project, also demonstrated that women who perceived themselves at high risk of breast cancer were more likely than others to have had at least one prior mammogram. The Gail score[6] was associated with subjective estimates of risk in their study. By contrast, the objective assessment of breast cancer risk obtained in our population by the summation of selected risk factors for this disease was not associated with a woman's perception of her own risk. Although this approach is relatively crude and would need further validation, it has been used elsewhere, especially for research purposes about selective screening. We used it because the detailed information necessary with more sophisticated methods of risk estimation, especially about the pattern of family occurrence of breast cancer, was not available. Recent validation studies of the Gail model have however emphasized its limitations when used in the general population.[21,22] Finally, given the cross-sectional nature of the present study, the assumed temporal directionality of most associations reported here should be interpreted with caution. For example, while it may be that higher perceived risk leads women to participate in breast screening by mammography, it may also be that having a mammogram raises attention regarding any information about breast cancer.

For those of us who are involved in cancer control, this work provides clues as to the current extent of risk misapprehension and the target groups most likely to benefit from the diffusion of information on breast cancer. However, information should be presented in a nonthreatening manner, and combined with other strategies to maximize adherence with screening recommendations.

REFERENCES

1. Becker MH (Ed.). The health belief model and personal health behavior. *Health Educ Monogr* 1974;2:324-473.
2. Janz NK, Becker MH. The health belief model: A decade later. *Health Educ Q* 1984;11:1-47.
3. Evans DGR, Burnell LD, Hopwood P, Howell A. Perception of risk in women with a family history of breast cancer. *Br J Cancer* 1993;67:612-14.
4. Claus EB, Risch N, Thompson WD. Genetic analysis of breast cancer in the Cancer and Steroid Hormone Study. *Am J Hum Genet* 1991;48:232-42.
5. Lerman C, Lustbader E, Rimer B, et al. Effects of individualized breast cancer risk counseling: A randomized trial. *J Natl Cancer Inst* 1995;87:286-92.
6. Gail MH, Brinton LA, Byar DP, et al. Projecting individualized probabilities of developing breast cancer for white females who are being examined annually. *J Natl Cancer Inst* 1989;81:1879-86.
7. Black WC, Nease RF, Tosteson ANA. Perceptions of breast cancer risk and screening effectiveness in women younger than 50 years of age. *J Natl Cancer Inst* 1995;87:720-31.
8. Dubin N, Pasternack BS. Risk assessment for case-control subgroups by polychotomous logistic regression. *Am J Epidemiol* 1986;123:1101-17.
9. Fischhoff B, Bostrom A, Quadrel MJ. Risk perception and communication. *Annu Rev Public Health* 1993;14:183-203.
10. Bar-Hillel M, Fischhoff B. When do base rates affect predictions? *J Personality Soc Psychol* 1981;41:671-80.
11. Kash KM, Holland JC, Halper MS, Miller DG. Psychological distress and surveillance behaviours of women with a family history of breast cancer. *J Natl Cancer Inst* 1992;84:24-30.
12. Lerman C, Daly M, Sands C, et al. Mammography adherence and psychological distress among women at risk for breast cancer. *J Natl Cancer Inst* 1993;85:1074-80.
13. Santé Québec; Bellerose C, Lavallée C, Chénard L, Levasseur M. (sous la direction de). Et la santé, ça va en 1992-1993? Rapport de l'Enquête sociale et de santé 1992-1993, Volume 1. Ministère de la santé et des services sociaux, Gouvernement du Québec, 1995.
14. Vogel VG, Graves DS, Vernon SW, et al. Mammographic screening of women with increased risk of breast cancer. *Cancer* 1990;66:1613-20.
15. Kaplan KM, Weinberg GB, Small A, Herndon JL. Breast cancer screening among relatives of women with breast cancer. *Am J Public Health* 1991;81:1174-79.
16. Hailey BJ. Family history of breast cancer and screening behaviour: An inverted U-shaped curve? *Medical Hypotheses* 1991;36:397-403.
17. Stefanek ME, Wilcox P. First degree relatives of breast cancer patients: Screening practices and provision of risk information. *Cancer Detection Prev* 1991;15:379-84.
18. Mah Z, Bryant H. Age as a factor in breast cancer knowledge, attitudes and screening behaviour. *CMAJ* 1992;146:2167-74.
19. Breslow R, Kessler L. Knowledge of breast cancer risk, by age. *J Natl Cancer Inst* 1995;87:1109.
20. Bondy ML, Vogel VG, Halabi S, Lustbader ED. Identification of women at increased risk for breast cancer in a population-based screening program. *Cancer Epidemiol Biomarkers & Prev* 1992;1:143-47.
21. Bondy ML, Lustbader ED, Halabi S, et al. Validation of a breast cancer risk assessment model in women with a positive family history. *J Natl Cancer Inst* 1994;86: 620-25.
22. Spiegelman D, Colditz GA, Hunter D, Hertmark E. Validation of the Gail et al model for projecting individual breast cancer risk. *J Natl Cancer Inst* 1994;86:600-7.

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