

Lifestyle Factors

The variations seen both regionally and internationally in breast cancer incidence have heightened interest in the medical community in the role of lifestyle-related influences. In general, the majority of risk in breast cancer is explained by non-inherited environmental factors. The role of diet, nutrition, and obesity as well as individual nutrients has been of interest, in light of obvious cultural and geographic variations, as well as their potential modifiability. Similarly, exposures to known carcinogens, including tobacco and radiation, have been explored in many studies.

Obesity

The State of the Science

The role of weight and weight gain and its impact on breast cancer risk is complex but significant. There is a differential effect on premenopausal vs. postmenopausal breast cancer, and a differential effect based on the age of a woman when she gains weight.¹⁵



Children who are heavier at birth seem to have a modest increase in breast cancer risk in postmenopausal years, yet an increase in weight gain in pre-adolescence has been shown to *reduce* later risk. Prenatal and early childhood weight gain is associated with increasing adult height, which may result in a modest increase in breast cancer risk. One potential mediator of this effect is higher levels of Insulin-like Growth Factor-1 (IGF-1). Thus, early childhood and even prenatal weight and height growth may play a role in later adult breast cancer risk. While premenopausal (ER-) breast cancer is increased in women at lower body weight, the risk for postmenopausal (ER+) breast cancer is enhanced by increasing weight. Weight gain between the ages of 20 and 40 also significantly increases a woman's risk of developing postmenopausal breast cancer.

Multiple studies now indicate that increased body weight is associated with adverse outcomes in women who are diagnosed with breast cancer. This includes a higher risk of recurrence and a greater risk of mortality. This has been demonstrated for both pre- and postmenopausal breast cancer.¹⁶ Multiple explanations have been suggested, including higher stage at diagnosis and inadequate dosing of therapy, as well as higher levels of tumor promoters such as estrogen and insulin. Recent information suggests an important role for weight-related insulin resistance and higher insulin levels.^{17, 18}

What Women Think

A majority of women (73%) felt obesity was *very* (36%) or *somewhat* (37%) *important* in breast cancer development. All ethnic groups shared this view, including 66% of African-American, 77% of Hispanic and 73% of Caucasian women.

- Twenty percent (20%) of African-American women felt obesity was *not at all important* as a risk factor, significantly greater than Hispanic (7%) or Caucasian women (8%).

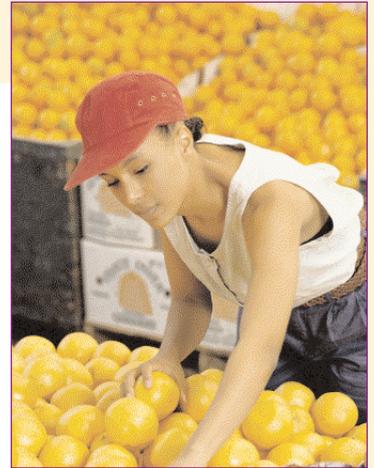
A large majority of women did recognize the relationship between obesity (body weight) and breast cancer, with 73% of respondents believing it was of significance. Hispanic women (77%) were more likely to hold this view than either African-American (66%) or Caucasian (73%) women.

Despite the growing recognition of the role that obesity plays in both breast cancer development and mortality, only a small minority of women surveyed mentioned either diet (11%) or exercise (6%) as ways to limit obesity and breast cancer risk. There is particular concern about breast cancer risk in the future given the growing levels of obesity in childhood, adolescence and adulthood.

Low-Fat Diet

The State of the Science

Early studies, largely international and case-control, suggested a higher risk for breast cancer with increasing total fat intake. This had been one favored explanation for the marked discrepancy between breast cancer incidence rates in Western, developed countries and those in Asia, Africa and other parts of the third world.¹⁹ More recent, large, prospective cohort studies now suggest a limited association between total fat intake, even in the lowest range of dietary fat (<20%) and breast cancer risk.²⁰ Recent results of a very large randomized trial, the Women's Health Initiative (WHI), assessing the benefits of a low-fat diet in reducing risk, were reported to be negative. However, in those women who were compliant with the low-fat diet, there was a trend toward lower breast cancer incidence.²¹



An increased intake of saturated fat may raise risk slightly, while intake of omega-3 fats (fish and flax oils) and, in particular, monounsaturated fats (olive oil) may lower risk.

In contrast to its uncertain role in breast cancer risk, a recent randomized trial in early-stage breast cancer has suggested that women on a very low-fat (<20%) diet may have a reduction in their chances of recurrence. This was found to be particularly beneficial in women with estrogen-

insensitive (ER-) breast cancers. Further studies are planned to confirm this benefit. Many researchers believe that the critical effect of a low-fat diet is its effect on lowering weight, thereby reducing promoters of tumor growth and progression.

What Women Think

Seventy-eight percent (78%) of all women surveyed believed a high-fat diet contributes to breast cancer risk. This was uniform across all ethnic groups, with a significant percentage of African-American (75%), Hispanic (82%) and Caucasian (77%) women believing a high-fat diet was *very* or *somewhat important*.

- Fifteen percent (15%) of African-American women felt it is not at all important, in contrast to 6% of Hispanics and 7% of Caucasians.

A majority of women surveyed (78%) felt that eating a high-fat diet is a significant risk factor for breast cancer. Women in all ethnic groups, including African-American (75%), Hispanic (82%) and Caucasian (77%) shared this belief. This represented one of the most consistently highly ranked risk factors by most women.

This may reflect the long-standing and well-publicized belief in the importance of low-fat diets. Despite this widely held belief, the evidence for its role remains uncertain. The critical role of weight and excess caloric intake over a woman's life appears to be more important.

Alcohol Consumption

The State of the Science

Alcohol is the most consistent dietary factor linked to breast cancer risk, in all populations studied. There is a consistent, though small, increase in risk with increasing alcohol ingestion.²² This risk is associated with all forms of alcohol, including beer, wine or spirits. Women who consume two to five drinks daily have up to a 40% higher risk than nondrinkers; however, regular folic acid intake may limit alcohol-related risk. Because mild to moderate alcohol intake may be associated with lower overall mortality, reflecting, in large part, a reduction in cardiovascular mortality, the decision to limit alcohol should be based on a woman's overall health risks. Some studies suggest that alcohol in modest amounts has no impact on survival in women who already have breast cancer.



What Women Think

Overall, 56% of all women viewed alcohol consumption as a *very important* (20%) or *somewhat important* (36%) contribution to breast cancer risk.

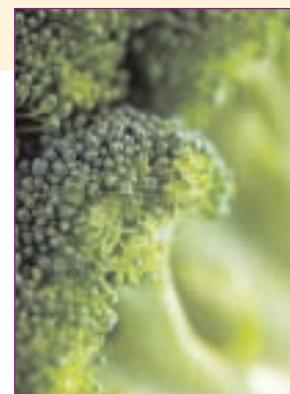
- African-American (69%) and Hispanic (65%) women were more likely to feel that alcohol was a significant risk factor than Caucasian (53%) women. However, a higher number of Hispanic women (24%) believed it was *not at all important*, in contrast to African-American (11%) and Caucasian (14%) women.

More than half the women interviewed (56%) believed that alcohol plays a significant role in breast cancer etiology, with both African-American (69%) and Hispanic (65%) women attributing greater significance to this factor than Caucasian (53%) women. Despite this belief, only a small percentage of women (3%) stated that they limit alcohol intake as a preventive strategy.

Vegetables/Fiber

The State of the Science

Eating cruciferous **vegetables** (broccoli, cabbage, cauliflower and brussels sprouts) and legumes (lentils, peas and various beans) may confer a modest, but consistent, reduction in risk with increasing vegetable intake. The benefit may be greater in pre-menopausal breast cancer and in those women with a family history of breast cancer.²³ Diets rich in vegetables and fruit are frequently associated with lower total caloric intake, which may in part contribute to risk reduction. **Fiber** intake does not confer a reduced lifetime risk of developing breast cancer, according to most studies.



Vitamin Intake

The State of the Science

An increased intake of vitamins C and E is not associated with a lower risk of breast cancer. Most studies support a modest decrease in risk with increased carotenoid intake from plant sources, but not from preformed vitamin A from animal sources.²⁴ Recent studies suggest a reduction in risk with increased ingestion of vitamin D, but the impact of the vitamin source (UV-related vs. diet vs supplement) remains unclear. Many studies support a reduction in risk with increased folate intake, either dietary or supplement, particularly in women who consume alcohol on a regular basis.²⁵

Caffeine

The State of the Science

There is no increased risk associated with beverages containing caffeine.



Physical Activity

The State of the Science



Many, but not all, studies demonstrate a reduction in breast cancer risk with increasing physical activity. Most indirect evidence favors a reduction in risk, particularly for postmenopausal, estrogen-sensitive (ER+) breast cancer, because of exercise's strong association with control of weight gain and reduction in circulating estrogen levels. Lifetime physical activity can be recreational or occupational.²⁶ Recent evidence suggests a reduction in recurrence in early-stage breast cancer for women who are significantly more active.²⁷ Moderate exercise consisting of a vigorous walk for 30 or minutes or more on four to five days a week may significantly lower breast cancer mortality in women with breast cancer.

What Women Think

While women in this survey were not specifically asked about exercise and risk, they were questioned about what steps they took to lower risk. Only 6% mentioned exercise as an approach to reduce their risk.

This survey highlights the importance of educating women about the role of exercise and weight control in limiting the risk of breast cancer.

Tobacco Use and Smoking

The State of the Science

Most studies have failed to support a significant role in breast cancer risk for either active or passive cigarette smoking, although a modest risk from very early tobacco use cannot be excluded.²⁸ Recent data from California supports a very small increase in risk with active tobacco use. This risk may be present in women with inherited differences in metabolism of tobacco-related carcinogens. There is evidence for an increased risk in women with elevated levels of polycyclic aromatic hydrocarbons (PAHs).²⁹ PAHs are present in tobacco smoke, but they are also components of vehicle exhaust and home heating oil. Overall, the contribution of tobacco to breast cancer risk is felt to be very limited.



What Women Think

A very large majority of women in this survey considered smoking to be a major contributor to breast cancer risk. Eighty-eight (88%) percent of women felt it was *very* (64%) or *somewhat* (24%) *important*.

- All ethnic groups shared this view, with 75% of African-American, 74% of Hispanic and 61% of Caucasian women believing that smoking is *very important* in breast cancer risk.
- Only 9% of women felt smoking was *not too* (5%) or *not at all* (4%) *important* as a breast cancer risk factor. There were no ethnic differences in this opinion.

Exposure to Secondhand Smoke

The State of the Science

While some earlier studies suggested possible links between secondhand smoke and breast cancer risk, most studies have failed to reveal an association. The consensus among most breast cancer experts is that neither active nor passive smoking is associated with an appreciable increase in breast cancer risk.³⁰

What Women Think

Nearly three-quarters of women surveyed consider secondhand smoke an *important* factor in breast cancer risk. Overall, 42% of women rank this as *very important* and 31% as *somewhat important*.

Despite the absence of a significant connection between tobacco use and breast cancer, this was the single most highly ranked breast cancer risk factor (88%) after genetics and family history, with no differences between various ethnic groups. Similarly, almost two-thirds of women (73%) believed that secondhand smoke was a significant risk factor. Here, more African-American (87%) and Hispanic (82%) women held this view than Caucasian (70%) women.



These beliefs may reflect the widespread public awareness of smoking as the leading risk factor in lung cancer, as well as other malignancies (head and neck, pancreas). While tobacco use is clearly the single, leading public health risk factor in the U.S., there are potential adverse consequences to this belief. Nonsmoking women who hold this belief may feel less vulnerable to breast cancer and thus less inclined to follow screening recommendations. As with genetics and family history, nonsmoking women should be aware they may be at average or even increased risk of breast cancer, based on their own risk profile.