

PHYSICAL ACTIVITY AND BREAST CANCER PREVENTION: RELEVANT FOR NEWLY INDUSTRIALIZED COUNTRIES?

In recent years, there has emerged a substantial body of evidence collectively showing that physical activity is inversely related to the risk of developing breast cancer, particularly post-menopausal breast cancer. The data come primarily from observational epidemiologic studies (more than 60 such studies), with the inverse association being supported by biologically plausible mechanisms suggested from basic science and animal studies, as well as experimental studies in humans. These mechanisms include changes in menstrual cycles and sex steroid hormones; reductions in body weight, with concomitant favorable changes in sex steroid hormones, sex-hormone binding globulin, insulin-like growth factors, insulin sensitivity and glucose levels, and inflammation; and improved immune function.

The epidemiologic studies, on average, indicate that active women have about a 20-30% reduction in risk, compared with inactive women. Perhaps some 3-4 hours a week of at least moderate-intensity physical activity is needed for this risk reduction. While the inverse relation between physical activity and breast cancer risk is well-established, details of the relationship are less clear. For example, is there also a dose-response relation? What is the optimal intensity, duration, and frequency of physical activity? At what age (or ages) is physical activity most relevant for breast cancer risk? Does the relationship differ for different subgroups of women (e.g., women with lower vs. higher body mass index, nulliparous vs. parous women, etc.) or types of breast cancer (e.g., hormone-receptor negative vs. positive cancer)?

In spite of the questions that remain regarding the details of the physical activity-breast cancer relation, it is well-accepted that higher levels of physical activity can reduce the risk of breast cancer. For example, experts on the Physical Activity Guidelines Advisory Committee to the US Department of Health and Human Services in 2008 concluded that: “In **adults and older adults** strong evidence demonstrates that, compared to less active counterparts, more active ... women have lower rates of ... breast cancer”.

But, how relevant is this for women in newly industrialized countries such as Brazil?

First, let us consider where the studies of physical activity and breast cancer have been conducted. Most of these studies have been conducted in North America and Europe, although a few studies also have emerged from Asia and Australia. Thus, most of the data have come from studies conducted in Caucasian populations. From the limited data that do exist in women of other race/ethnic groups, it does not appear that the relationship differs for non-Caucasian women. For example, in the US Black Women's Health Study, strenuous physical activity for at least 7 hours/week in adulthood was significantly associated with a lower risk of breast cancer. And, among Japanese women, those who engaged in regular sports and exercise had a lower risk of breast cancer, as did women who were physically active in their occupations. Additionally, the biological mechanisms postulated to underpin the physical activity-breast cancer relation seem likely to

hold for both Caucasian and non-Caucasian women.

Second, we might argue that women in newly industrialized countries are more likely to be physically active compared to those in North America and Europe, and thus do not need additional physical activity to lower their breast cancer risk. It is true that in countries undergoing rapid modernization, many women still participate in hard physical labor, and transportation likely includes much walking and cycling. However, their levels of physical activity are declining over time, and so physical activity must continue to be emphasized as an important health behavior that can lower not only breast cancer risk, but the risks of many non-communicable chronic diseases, the incidences of which are now rising in countries undergoing rapid modernization.

Finally, we might argue that breast cancer is not a major cause of morbidity and mortality in newly industrialized countries, since major risk factors – e.g., late age at first childbearing, less breastfeeding, obesity, use of postmenopausal hormones – all are less prevalent than in developed countries. It is true that the lifetime risk of dying from breast cancer is higher in the developed countries, estimated by the World Health Organization to be about 33 per 1,000 among women in high-income countries, compared with <15 per 1,000 in low- and lower/middle-income countries. However, the population of women in the latter countries is far larger than those in the high-income countries, and thus, with regard to actual numbers of women dying from breast cancer, the number is

likely to be larger for the low- and lower/middle-income countries (it has been estimated that only 20% of deaths from all chronic diseases, including breast cancer, will occur in high-income countries, and 80% from low- and middle-income countries).

In conclusion, the available data indicate that women can lower their risk of breast cancer by being physically active. While limited data exist for non-Caucasian populations, it is likely that the relation holds for women belonging to other race/ethnic groups. And, while breast cancer does not rank as high on the list of leading causes of death among women from low- and middle-income countries compared with high-income countries, the actual numbers of women dying from breast cancer is higher from the former countries, which hold a far larger proportion of the world's population. Thus, the inverse relation between physical activity and breast cancer also is important for women in newly industrialized countries, such as Brazil. Researchers are strongly encouraged to examine the relation between physical activity and breast cancer in these countries, to add empirical evidence regarding physical activity and breast cancer risk in women from newly industrialized countries.

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