



Research Article

Weight Gain and its Correlates among Breast Cancer Survivors

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SUMMARY

Purpose: Weight gain after diagnosis of breast cancer is a profound issue that may negatively impact cancer prognosis. However, most existing research on weight change has been conducted in Western countries. In addition, several factors related to weight gain have been reported; however, the evidence is inconsistent. The purpose of this study was to examine weight gain and its correlates among Korean breast cancer survivors.

Methods: A total of 132 female breast cancer survivors were recruited from one university hospital in South Korea. Participants completed anthropometric measurements (i.e., body weight, height) and a self-reported questionnaire, including the International Physical Activity Questionnaire Short Form and Mini Dietary Assessment.

Results: The mean weight change was -0.09 kg ($SD = 4.28$). Only 27 women (19.7%) gained more than 5% of their weight at diagnosis, 59.1% maintained weight, and 21.2% lost weight. In multivariate logistic regression analysis, significant correlates of weight gain were younger age, obesity at diagnosis, duration of more than 36 months since diagnosis, and low diet quality.

Conclusion: Younger women, women who were obese at diagnosis, women with more than 36 months since diagnosis, or women who showed lower diet quality should be considered at high-risk for weight gain. Findings from our study suggest that optimal weight management strategies should be developed using ethnically- or culturally-appropriate approaches.

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Introduction

Breast cancer is the second most commonly diagnosed cancer among Korean women (National Cancer Information Center, 2012). Although the incidence of breast cancer in Korea is lower than that in Western countries, it is rapidly increasing, with an annual growth rate of 6.3% (National Cancer Control Institute). Due to early detection and advanced medical treatment, the 5-year survival rate in Korean breast cancer patients has increased from 77.9% in 1993–1995 to 90.6% in 2005–2009 (National Cancer Control Institute), which is comparable to that in the United States and Canada. As the number of breast cancer survivors increased, cancer survivorship issues among this population have become more important.

Weight gain is a common and persistent problem for many breast cancer survivors (Vance, Mourtzakis, McCargar, & Hanning, 2011). As many as 50–96% of women diagnosed with breast cancer experience significant weight gain during treatment (Rock & Demark-Wahnefried, 2002). Weight gain usually ranges from

1.0 kg to 6.0 kg during the first year after diagnosis (Demark-Wahnefried et al., 2001; Goodwin, 2001; Irwin et al., 2005; Makari-Judson, Judson, & Mertens, 2007). Several studies have reported that weight gain after breast cancer diagnosis may have a negative impact on quality of life, increase the risk for recurrence, and shorten survival time (Chlebowski, Aiello, & McTiernan, 2002; Demark-Wahnefried, Rimer, & Winer, 1997; Kroenke, Chen, Rosner, & Holmes, 2005).

Weight gain is more common in women receiving adjuvant chemotherapy, particularly for women undergoing treatments that require a longer duration, and it appears to be especially pronounced in premenopausal women (Caan et al., 2008; McInnes & Knopf, 2001; Vance et al., 2011). Other factors suggested to influence weight gain after cancer diagnosis include age (Caan et al., 2008; Chen et al., 2011; Gu et al., 2010), advanced disease stage (Caan et al., 2008; Gu et al.; Irwin et al., 2005; Saquib et al., 2007), decreased physical activity (Demark-Wahnefried et al., 1997; Irwin et al.; Rock et al., 1999) and increased energy intake (Chen et al.; Demark-Wahnefried et al., 1997; Rock et al., 1999). However, the evidence is limited and inconsistent. For example, Goodwin et al. (1999) reported that adjuvant chemotherapy was a strong and independent clinical factor of weight gain. The Health, Eating,

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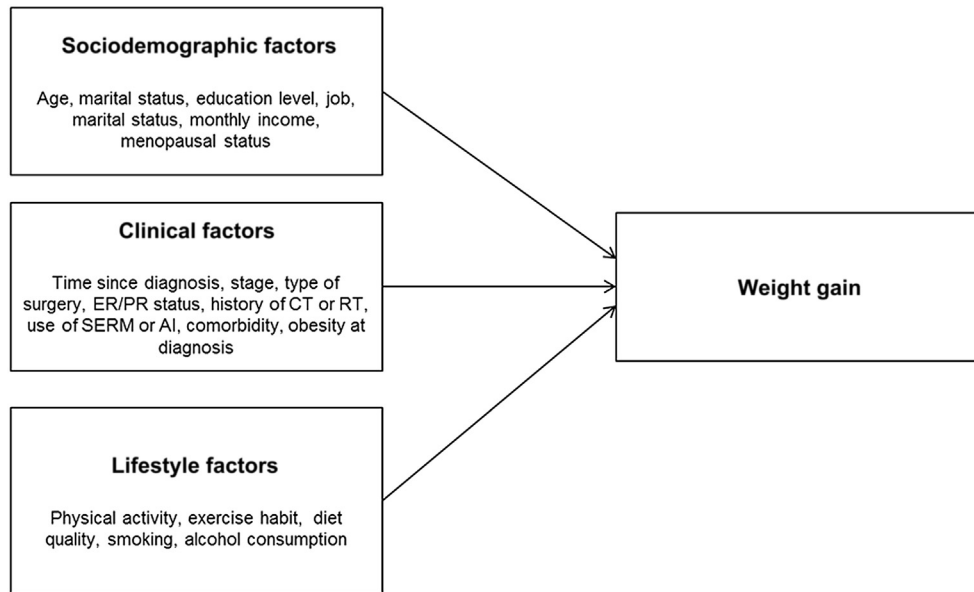


Figure 1. Conceptual framework for the study. Note. ER = estrogen receptor; PR = progesterone receptor; CT = chemotherapy; RT = radiation therapy; SERM = selective estrogen receptor modulator; AI = aromatase inhibitor.

Activity, and Lifestyle Study reported an association of receiving chemotherapy with greater weight gain (Irwin et al.). However, a Korean study found that women with early stage breast cancer did not gain weight after adjuvant chemotherapy (Han et al., 2009), which was similar to the results of the study by Campbell, Lane, Martin, Gelmon, and McKenzie (2007) in Canada. In addition, premenopausal status showed a significant association with weight gain (Caan et al., 2008; Chen et al.; Heideman, Russell, Gundy, Rookus, & Voskuil, 2009), contradicting findings from the Health, Eating, Activity, and Lifestyle Study (Irwin et al.) and the Korean study (Han et al.).

Most existing research on weight change has been conducted in Western countries, where the prevalence of obesity is relatively high (Demark-Wahnefried et al., 2001; Goodwin et al., 1999; Irwin et al., 2005; McInnes & Knopf, 2001; Rock et al., 1999). The prevalence of obesity [body mass index (BMI) ≥ 30 kg/m²] and of overweight and obesity combined (BMI ≥ 25 kg/m²) in the US were 35.7% and 68.8% (Flegal, Carroll, Ogden, & Curtin, 2010), respectively. On the other hand, those in Korea were 3.9% and 30.9%, respectively (Oh, 2011). Because there are differences in the epidemiology of obesity and breast cancer between Asian and Western regions, there may also be ethnic differences in the pattern of weight gain after initiation of breast cancer treatment (Han et al., 2009). However, few studies have investigated weight change and related factors among Asian women after breast cancer diagnosis. Han and colleagues conducted a retrospective study of weight change after breast cancer diagnosis among the Korean population. They found no weight gain after adjuvant therapy for breast cancer, which is inconsistent with previous findings from Western countries (Chlebowski et al., 2002; Demark-Wahnefried et al., 1997; Goodwin et al., 1999; McInnes & Knopf). However, in a population-based cohort study among Chinese women, Gu et al. (2010) reported that weight gain was common over the first 3 years after breast cancer diagnosis. Thus, patterns of weight change among Asian breast cancer survivors remain controversial. In addition, there were differences in the correlates of weight change. For example, in the study by Han et al., BMI at diagnosis and hormone therapy showed significant correlations with weight change, while in the study by Gu et al., age, stage and comorbidity were significant

factors showing an association with weight gain. These two studies only evaluated correlates in terms of sociodemographic and clinical factors while they did not include lifestyle factors related to weight gain.

Therefore, the aims of the current study were to examine the prevalence of weight gain and its correlates among Korean breast cancer survivors. For comprehensive identification of correlates of weight gain, we developed a conceptual framework that included sociodemographic, clinical, and lifestyle factors for explaining weight gain (Figure 1). We expect that our findings will help identify women who are most at risk and will inform the development of culturally-appropriate weight management interventions aimed at promoting overall health and long-term survivorship.

Methods

Study design

This study used a retrospective and cross-sectional descriptive study design.

Setting and sample

Participants were breast cancer survivors from the outpatient department of the breast cancer center at a university hospital in South Korea. Participants were included in this study if they (a) were women who had histologically confirmed stage I–III breast cancer, (b) had received at least one treatment for breast cancer, and (c) had completed their primary treatment, except hormone therapy. Participants were excluded if they (a) had distant metastasis, (b) had a previous or concurrent history of other cancer(s), or (c) did not have a baseline body weight.

To verify the statistical power of our sample, we used the G*Power 3.1 software (Faul, Erdfelder, Buchner, & Lang, 2009). The sample size required in logistic regression method was 132 with the following parameters: odds ratio (OR) = 1.69, Cronbach's α = .05, power = 80%, rate of outcome = 44% based on previous research (Saqib et al., 2007). Of the 185 breast cancer survivors

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