

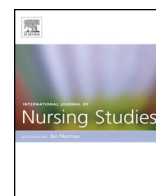


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# A Web-based self-management exercise and diet intervention for breast cancer survivors: Pilot randomized controlled trial<sup>☆</sup>

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### ABSTRACT

**Background:** Regular exercise and dietary practices have been shown to affect the health-related quality of life (HRQOL) and survival of breast cancer patients.

**Objective:** The current study aimed to investigate whether the WSEDI was a feasible and primarily effective method for promoting exercise and dietary behaviours for breast cancer patients.

**Design:** A 12-week randomized, controlled trial.

**Setting:** Oncology outpatient treatment clinics at 3 university hospitals and 1 National Cancer Center in South Korea.

**Participants:** Fifty-nine breast cancer patients who had received curative surgery and completed primary cancer treatment within 12 months prior to the study and who had been diagnosed with stage 0–III cancers within 2 years prior to the study were recruited.

**Methods:** Participants were randomly assigned to either the intervention group, which used a Web-based self-management exercise and diet intervention program incorporating transtheoretical model (TTM)-based strategies ( $n = 29$ ), or to the control group, which used a 50-page educational booklet on exercise and diet ( $n = 28$ ). The intervention efficacy was measured at the baseline and 12 weeks via a Web-based survey that addressed the promotion of exercise and consumption of 5 servings of fruits and vegetables (F&V) per day, dietary quality, HRQOL, anxiety, depression, fatigue, motivational readiness, and self-efficacy.

**Results:** The proportion of subjects who performed at least moderate-intensity aerobic exercise for at least 150 min per week; ate 5 servings of F&V per day; and had overall improvements in dietary quality, physical functioning and appetite loss (HRQOL), fatigue, and motivational readiness was greater in the intervention group than in the control group. The self-efficacy with respect to exercise and F&V consumption was greater in the

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intervention group than in the control group. A Web-based program that targets changes in exercise and dietary behaviours might be effective for breast cancer survivors if the TTM theory has been used to inform the program strategy, although further research with a larger sample size is required to enable definitive conclusions.

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### What is already known about the topic?

- Regular exercise and dietary practices have been demonstrated to affect the health-related quality of life (HRQOL) and survival of breast cancer patients.
- To date, most exercise and dietary interventions that had been developed for cancer survivors required clinic-based face-to-face counselling sessions; however, when the intervention ends and the participants cannot receive feedback from the experts, and the motivation for regular exercise and diet practices decreases, their effects could not be observed or sustained.

### What this paper adds

- A Web-based self-management intervention program was developed to target changes in exercise and dietary behaviours using transtheoretical model (TTM)-based strategies. This Web-based program might provide an effective alternative with regards to improving the weekly exercise duration, the daily fruit and vegetable (F&V) intake, overall dietary quality, physical functioning, appetite loss, and fatigue; however, further research with a larger sample size is required.

## 1. Background

Breast cancer is the most common cancer among women in many countries, but survival rates of breast cancer have steadily improved over the past 30 years (American Cancer Society, 2011). Putting on weight after cancer diagnosis or cancer treatment increases the incidence of chronic disease and re-occurring cancer (Herman et al., 2005). Healthy weight maintenance has been shown to affect both the health-related quality of life (HRQOL) (Demark-Wahnefried et al., 2002; Herman et al., 2005) and survival of breast cancer patients (Calle et al., 2003). For these reasons, retaining a normal weight is a high priority when assessing the needs of cancer survivors (Jones and Demark-Wahnefried, 2006). Regular exercise and a well-balanced diet are prerequisites for the maintenance of a healthy weight.

To date, most exercise and dietary interventions that had been developed for cancer survivors employed intensive clinic-based face-to-face counselling sessions (Courneya et al., 2003; Jones and Demark-Wahnefried, 2006; Pinto et al., 2005). Although the efficacy of such interventions is apparent immediately after delivery, once sufficient time has elapsed, the effects of the intervention cannot be found. The reason is that when the clinic-based face-to-face intervention ends, the participants cannot receive feedback from the experts, and the motivation for regular exercise and diet practices decreases (Daley et al.,

2007). Further, accessibility issues such as the remote location of the clinic, time taken to travel to the clinic, and encountering traffic are considerable barriers to the successful delivery of clinic-based face-to-face interventions (Jones et al., 2007). One suggested method to address the disadvantages of a clinic-based intervention was to employ a Web-based intervention program that could provide both feedback and the motivation to maintain regular exercise and dietary practices.

Several Web-based “cancer management” programs intended to improve breast cancer survivors’ HRQOL have been developed, and their efficacies have been evaluated. Web-based programs for the management of adverse effects (Golant et al., 2003), informational and emotional support and assistance with decision-making regarding cancer treatment-associated survivorship care planning (Gustafson et al., 2001), and improving psychological and emotional coping skills (Owen et al., 2005) were previously developed. All Web-based programs were shown to improve HRQOL (Golant et al., 2003; Gustafson et al., 2001), increase social support (Gustafson et al., 2001), alleviate anxiety and depression (Owen et al., 2005), and encourage patient participation in health management (Gustafson et al., 2001). Regarding exercise and dietary management, several Web-based programs have been developed for patients with gout and diabetes (Kim, 2007; Oh et al., 2011). However, there are few Web-based self-management programs intended to address exercise and dietary practices and improve HRQOL in cancer survivors. Web-based interventions into chronic disease settings for cancer survivors can improve patient empowerment and might subsequently improve the survivors’ health statuses and quality of life and reduce their need for supportive care (Kuijpers et al., 2013).

According to the transtheoretical model (TTM) (Prochaska and DiClemente, 1983), increasing the stage of change (Frith et al., 2010), enhancing self-efficacy (Frith et al., 2010; Luszczynska et al., 2011), and encouraging the process of change (Pollak et al., 1998) can create behavioural changes that consequently lead to improvements in the HRQOL (Courneya et al., 2003; Daley et al., 2007; Voskuil et al., 2010), depression (Daley et al., 2007; Eyigor et al., 2010; Pinto et al., 2005), anxiety (Pinto et al., 2005), and fatigue (Courneya et al., 2003; Pinto et al., 2005). To date, previous studies have identified the possibility that the TTM theory could be applied to a Web-based intervention by showing that the programs had effects on healthy behaviour changes (Huang et al., 2009; Kim and Kang, 2006). Within the background described above, we previously developed a Web-based self-management exercise and diet intervention program (WSEDI) that applied TTM-based strategies (Lee et al., 2013).

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