

東海大学大学院令和6年度博士論文

Efficacy of nursing interventions using
motivational interviewing aimed at
weight loss in overweight/obese breast
cancer patients undergoing endocrine
therapy

(内分泌療法を受けている過体重／肥満の
乳がん患者における減量を目的とした
動機づけ面接を用いた看護介入の有効性)

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先端医科学専攻

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1. Summary

Breast cancer is the most common cancer in women worldwide, accounting for 15% of female deaths. Breast cancer is composed of three major subtypes and recurrence with distant metastasis is considered to be incurable with the currently available therapies. Therefore, patients with hormone receptor-positive breast cancer, which accounts for 70% of all breast cancers, are treated with postoperative adjuvant endocrine therapy to prevent recurrence.

On the other hand, overweight/obese breast cancer patients, regardless of tumor size or lymph node involvement, have reduced efficacy of adjuvant endocrine therapy and increased breast cancer-related and all-cause mortality and recurrence rates. Therefore, multidisciplinary weight loss intervention trials have been conducted in overweight/obese breast cancer patients.

However, clinical practice barriers such as time constraints, understaffing, and economic

constraints limit the implementation of multidisciplinary interventions. Therefore, this study evaluated a nurse-led intervention to support a 5% weight loss in overweight/obese breast cancer patients with a baseline body mass index (BMI) of 25 kg/m² or greater who were receiving adjuvant endocrine therapy. The intervention consisted of a nurse-led motivational interviewing (MI) at baseline and weeks 4, 8, and 12.

MI is a communication technique that increases patients' intrinsic motivation and willingness to change by focusing on ambivalence (e.g., I want to eat but lose weight) and eliciting motivation (e.g., I want to wear clothes one size smaller when I lose weight) to help them achieve their goals.

The weight loss lifestyle (diet, exercise) was based on the American Society of Oncology guidelines for self-directed weight loss.

The primary endpoint was post-intervention weight change compared to baseline. The Secondary endpoints included BMI, physical activity time, sedentary time, self-efficacy, and mood. Results showed that while the average weight loss from baseline to 12 weeks was only 3.9%, 51.9% of participants lost at least 5% of their body weight, physical activity increased, sedentary time decreased, mood remained at an average level, and no adverse events were observed. These behavioral changes provide additional evidence that nurse-led MI can contribute to weight loss in breast cancer patients who are overweight or

obese. In conclusion, the intervention contributed to weight loss in a certain percentage of patients, although the effectiveness of the nurse-led MI intervention could not be validated. In addition, the intervention was associated with increased physical activity and decreased sedentary time, suggesting that it may promote healthier behaviors in these patients.

2. Background and Introduction

Breast cancer is the most common cancer among women worldwide, accounting for 15% of all cancer deaths in this population. Breast cancer consists of three major tumor subtypes classified according to estrogen or progesterone receptor expression and HER2(human epidermal growth factor receptor type2) gene amplification, and based on tumor subtype, multidisciplinary treatment is recommended, including surgery, endocrine therapy, chemotherapy, and radiotherapy. Recurrence with distant metastasis is considered incurable with currently available treatments. Therefore, adjuvant systemic therapy is often used to reduce the risk of recurrence. 70% of breast cancers are hormone receptor-positive. For patients with early-stage hormone receptor-positive breast cancer, adjuvant endocrine therapy for 5 to 10 years is recommended in addition to surgery to reduce the risk of recurrence and death. However, previous studies have shown that the efficacy of standard adjuvant endocrine therapy is reduced in obese breast cancer patients, regardless of tumor

size or the presence of lymph node metastases. Additionally, obese women have a 35% higher rate of breast cancer recurrence and a 41% increase in breast cancer-related mortality and all-cause mortality. Furthermore, disease-free survival was found to be worse in severely obese patients than in underweight/normal-weight patients. Obesity is a risk factor for cancer development and is associated with poor prognosis in several tumor types. The energy imbalance associated with obesity leads to systemic inflammation, including activation of the insulin/insulin-like growth factor-1 signaling pathway and altered levels of leptin, adiponectin, steroid hormones, and cytokine. Weight loss in overweight/obese patients with breast cancer has been shown to improve survival, and prospective trials of multidisciplinary interventions for 7-10% weight loss are under way. Although multidisciplinary interventions are suggested to be effective for successful lifestyle modification and weight loss in overweight/obese breast cancer survivors, implementing these multidisciplinary lifestyle interventions is impractical due to barriers such as time, human, and financial resources in the clinical setting. Nurses have utilized various behavioral altering perspectives and techniques such as cognitive behavioral therapy, the transtheoretical model, and motivational interviewing (MI) to support medication adherence in the management of chronic conditions such as type 2 diabetes, promote weight loss, provide treatment support for alcohol use disorders, and address chronic pain

and insomnia. MI, an interpersonal assistance theory, has been applied in clinical settings to manage cancer pain, maintain and improve adherence to oral chemotherapy, and improve cancer screening rates. The MI for lifestyle modification interventions and supportive self-management for weight loss in overweight/obese breast cancer patients may be more effective and straightforward than multidisciplinary lifestyle interventions; however, the efficacy has not been determined.

The purpose of this study was to evaluate the efficacy of nursing interventions utilizing MI to support weight loss in overweight/obese breast cancer patients undergoing postoperative adjuvant endocrine therapy.

3. Discussion

This study aimed to assess the effectiveness of MI as a nursing intervention for weight loss in overweight/obese breast cancer patients. Pre-set threshold for determining the clinical significance of MI intervention (i.e., an average weight loss rate of 5% at 12 weeks from the baseline) was not achieved. However, the results showed that the MI-based nursing intervention alone reduced body weight and BMI in breast cancer patients undergoing adjuvant endocrine therapy during all observation periods. Moreover, MI-based nursing intervention transformed physical activity and sedentary time into favorable

conditions for weight loss without increasing the patients' psychological burden.

A systematic review of interdisciplinary interventions demonstrated significant weight loss outcomes in women with breast cancer. In the weight loss intervention group, the weight loss rate over an intervention period ranging from 8 weeks to 1 year, compared to baseline, ranged from 3.3% to 13.9%, whereas weight changes in the control group ranged from -1.8% to +1.2%.

In considering studies with intervention periods similar to our research (i.e., 3 to 6 months), the range of weight loss rates varied from 1.6% to 5.9%. Our study's average weight loss rate throughout the entire study period was 3.9% (Table 2) , consistent with previous research. One previous report has suggested that MI alone had not significantly improved behavioral management programs for weight control in overweight/obese individuals. The other reports, though, have used MI to enhance physical activity levels and weight loss in cancer survivors, with favorable results. In the present study, more than half of the study participants achieved a weight loss of 5% or more (Figure 3a), and MI-based interventions resulted in behavioral changes such as increased physical activity (Figure 4a) and decreased sedentary behavior (Figure 4b). This suggests that nurse-led MI may influence lifestyle behavior change in overweight/obese patients. To our knowledge, this study is a new indication that MI-based nursing interventions can contribute to weight loss. This

study demonstrates the potential effectiveness of MI in weight management for overweight/obese breast cancer patients undergoing adjuvant endocrine therapy. It also revealed a correlation between employment and weight management, suggesting that employment contributes positively to weight management. However, it is essential to note that the findings of this study apply to a limited subset of breast cancer patients who are overweight/obese and undergoing adjuvant endocrine therapy.

As noted above, informed consent provided potential participants with the figures and clarification at the start of the study that overweight/obese individuals have an increased recurrence rate. This information may have been a motivating factor for the subjects. The aspect of cancer survivors' constant fear of recurrence is undeniable, and lifestyle changes as a coping behavior for fear of recurrence and fear of recurrence may have been one of the factors that led to weight loss.

Psychological adverse events in this study, as measured by mood, did not differ significantly from baseline during the 12-week intervention period. This indicates that the nursing intervention was average regarding psychological stress, and the absence of psychological adverse events in the nursing intervention is commendable.

All participants in this study were already overweight/obese at the time of diagnosis of breast cancer (data not shown). Although they had established their lifestyle habits pre-

study, positive lifestyle changes due to the Motivational Interviewing Nursing intervention resulted in BMI normalization in 14.8% of the participants. Furthermore, BMI normalization was sustained at the 24-week follow-up (Figure 3b).

The baseline BMI distribution (Table 2) showed that 40.7% of participants were classified as obese or higher. However, after 12 weeks of nursing intervention, this percentage decreased to 22.2%, with participants moving into the overweight category (BMI: 25-29 kg/m² or higher), 77.8% of all study participants being normal or overweight.

However, after the follow-up period, the number of participants with a BMI of 30 or greater increased to 33.3% during the follow-up period. This suggests the effectiveness of the 12-week nursing intervention. However, the short duration of the intervention may have compromised the overall efficacy, raising concerns about the duration of future nursing interventions.

As mentioned previously, obesity has been implicated in both increased risk of developing breast cancer and worse prognosis after breast cancer. Although it has already been shown that weight management should be part of a strategy to prevent breast cancer incidence, recurrence, and death, the results of this study do not suggest that weight management can help prevent recurrence or death. Further prospective studies are needed to determine whether weight loss leads to improved patient outcomes and are expected to support the

systematic incorporation of weight loss intervention strategies into the care of breast cancer patients.

This study has several limitations. First, we could not achieve a mean weight loss rate of 5% at 12 weeks from baseline with a single MI intervention conducted by nurses. Although there have been cases where a 5% weight loss was achieved in some instances, it cannot be concluded that nursing intervention using MI is clinically meaningful. One could also extend the duration of the nursing intervention to achieve a 5% weight loss. Second, the impact of weight loss on progression-free survival and overall survival in breast cancer survivors who are overweight or obese remains unknown. The effects of weight loss in overweight/obese breast cancer patients are pending the results of ongoing studies. Third, our outcome assessments did not include nutrition or body composition measurements. Lastly, in light of the nursing shortage, the timing of MI interventions in clinical applications needs to be reevaluated.

4. Conclusion

Although MI-based nursing intervention did not achieve the pre-set threshold of average body weight loss rate and its clinical effectiveness could not be verified, it contributed to weight loss at a specific rate. Moreover, the intervention did yield increased physical

activity and reduced sedentary time, demonstrating its potential to encourage healthier behaviors in these patients.