Asian Nursing Research 9 (2015) 312–317

Contents lists available at ScienceDirect

Asian Nursing Research

journal homepage: www.asian-nursingresearch.com

Research Article

Development and Preliminary Evaluation of Psychometric Properties of Symptom-Management Self-Efficacy Scale for Breast Cancer Related to Chemotherapy

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ARTICLE INFO

Article history:
Received 17 March 2015
Received in revised form
28 July 2015
Accepted 2 September 2015

Keywords:
drug therapy
neoplasms
self care
self efficacy
signs and symptoms

SUMMARY

Purpose: The purpose of this study was to develop and preliminarily evaluate the reliability and validity of the Symptom-Management Self-Efficacy Scale—Breast Cancer (SMSES-BC) related to chemotherapy.
Methods: The study included three stages. This paper presents the results of stage 2 and stage 3. In total, 34 items in the SMSES-BC were found during stage 1 from qualitative findings, a literature review, and expert suggestions; the 34 items were used for the psychometric properties test. Test-retest reliability and Cronbach α were assessed in the first sample, which included 45 participants for the pilot test (stage 2). The second sample, which included 152 patients, was used to assess the construct validity and concurrent validity (stage 3).
Results: The pilot test results revealed a test-retest reliability of .73 ($p < .001$) and Cronbach α coefficient of .96 for the total scale. Three factors (managing chemotherapy-related symptoms, acquiring problem solving, and managing emotional and interpersonal disturbances) were identified from exploratory factor analysis. Correlation coefficient r was .40 ($p < .001$), which supported the association between SMSES-BC and the General Self-Efficacy Scale for concurrent validity.
Conclusions: The study results demonstrate acceptable reliability and validity for the SMSES-BC that was developed for measuring symptom-management self-efficacy related to chemotherapy for patients with breast cancer. This study suggests further research to validate the construct of the SMSES-BC.

Introduction

Breast cancer is one of the most common cancers in the world. Among all cancers affecting women in Taiwan, it ranks first in terms of prevalence and fourth in terms of mortality [1]. Chemotherapy is the standard treatment and has improved the survival rate of breast cancer patients [2,3]. Depending on the stage of diagnosis, the overall survival rate of breast cancer varies from 27% to 100% [3]. However, complications from chemotherapy overwhelm the patient's overall quality of life [4,5], such as leukopenia, edema and diarrhea [6], specifically the side effects of multiple chemotherapy regimens on the patients progressive tumor [7]. As our understanding of cancer extended, the treatment of advanced breast cancer usually involves a combination of chemotherapy, hormone therapy, and target therapy [8].

Chemotherapy treatment has shifted from inpatient to outpatient care. Therefore, self-management is important for patients for controling symptoms related to chemotherapy at home [9]. Nevertheless, patients face various challenges related to the complications from chemotherapy because of the various symptom etiologies [10]. For example, pain may be caused by the cancer, and sleep disturbance may be caused by anxiety or the selected chemotherapy agents, which impede patients' capacity to self-manage the side effects and further obstruct the treatment effects.

Research has revealed that in performing self-management of side effects, patients usually confront many difficulties, including acquisition of accurate information and self-care skills if health professionals are busy at the clinic and situations in which the suggestions of health professionals are not suitable to the subject's condition. As a result, patients have difficulty developing self-care strategies [9,11,12].

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http://dx.doi.org/10.1016/j.anr.2015.09.001

Researchers have generally recommended education initiatives as a method for improving patient self-management behaviors related to chemotherapy; however, the execution of these strategies has not yet reached its potential [11,13]. In fact, the enhancement of a patient's knowledge and skill to improve patient behavior is limited. Patients may encounter various obstacles in conducting self-management behavior [9,12]. Indeed, traditional patient education may be insufficient in improving the management of side effects related to chemotherapy.

Many notions assert that belief is crucial for individual health behavior [14–16]. Self-efficacy is the belief in an individual's ability to perform a specific task according to the specific components of the health behaviors being performing [16,17]. Particularly, self-efficacy influences persistence and effort level for an individual to overcome difficult circumstances. Self-efficacy is a potentially modifiable variable; by itself, it can provide the basis for effective interventions to improve health outcomes. Instruments have addressed self-efficacy among cancer patients but have focused on either the global impact of the disease [18,19] or particular aspects of a cancer diagnosis [20], breast cancer survivor [21], communication [22] or analgesic use [23]. The availability of a psychometrically robust instrument that can explore the potential role of self-efficacy may enhance researchers' understanding of the patients' capability beliefs and also the health outcomes of patients with breast cancer who have received chemotherapy. Particularly, the chemotherapy regimens keep changing as new chemotherapies and biotherapies are being developed. Therefore, novel symptom management assessment should be reflective of this trend. Our study aim was to develop and evaluate the reliability and validity of the Symptom-Management Self-Efficacy Scale—Breast Cancer (SMSES-BC) in relation to chemotherapy.

Methods

The study was composed of three stages. Stage 1 focused on item generation, consisting of a qualitative interview that included 17 patients with breast cancer to identify main behaviors and tasks involved in the symptom management of chemotherapy. Stage 2 was a pilot test designed to evaluate the content validity and preliminary reliability of the initial scale developed from Stage 1. Stage 3 involved exploratory factor analysis, evaluating the concurrent validity of the SMSES-BC. This paper reports the results of stage 2 and stage 3. Approval to conduct the study was obtained from the institutional ethics committees of the participating agencies. All participants signed informed consent agreements.

Pilot test (Stage 2)

Instrument development

A draft of the 33-item, self-administered SMSES-BC for patients with breast cancer undergoing chemotherapy was developed from an earlier qualitative study and literature review. This scale included 3 items regarding communicating about chemotherapy-related concerns, 14 items concerning the measurement of chemotherapy-related symptoms, 7 items about managing emotional and interpersonal disturbances, and 9 items regarding acquiring relevant resources. Items in the scale were based on the categories that emerged from interview findings and the literature review to assess the main behaviors and tasks relevant to symptom-management self-efficacy.

In the SMSES-BC scale, there are 11-point responses for various behaviors, ranging from 0 to 10, with 0 signifying *not at all confident* and 10 signifying *complete confidence*. A higher response score indicates higher perceived symptom-management self-efficacy.

Six experts (2 oncology physicians, 3 oncology nursing experts, and 1 professor specializing in self-efficacy research) reviewed the initial version of the scale for relevance and clarity. Agreement on content validity ranged from .83 to 1.00; however, the experts suggested that two items for measuring communication about chemotherapy-related concerns be combined into one item. Additionally, these experts suggested that two more items be added: one item regarding managing chemotherapy-related symptoms and an item regarding acquiring relevant resources. Minor changes were made to the wording of some items according to panelist suggestions. Finally, 34 items of the scale were used in the pilot study.

Sample

The sample for stage 2 of the pilot study included 45 women (100%) from the oncology outpatient departments of two hospitals in the southern and northern areas of Taiwan. Participants had a breast cancer diagnosis that had received at least three courses of chemotherapy, were older than 18 years, and were conscious and able to sign the consent form. Participants' ages ranged from 30 years to 78 years old, with a mean age of 55.0 years (SD = 11.0 years). Most patients were married (71.1%), lived with others (84.4%), had an educational level of primary school or below (42.2%), were either Buddhist (57.7%) or Taoist (22.2%), and were not working (60.0%). Around 77.3% of the participants had a diagnosis of metastatic breast cancer.

Internal consistency

Internal reliability was tested using the Cronbach α coefficient of the scale and subscales. The initial Cronbach α for the entire scale was .96. Cronbach α of each of the four initial subscales that were developed for evaluating the main four constructs derived from the Stage 1 interviews exceeded .70. The current results revealed a recommended standard of above .70 [24].

Test-retest reliability

Stability was confirmed by test-retest with the initial pilot sample. The retest was performed approximately 2 weeks after the first completion of the scale. The current results of test-retest stability showed a significant correlation between the initial score and the retest score for all subscales ($r = .40$, $p < .001$ to $r = .78$, $p < .001$) and the total scale ($r = .73$, $p < .001$). The results supported good test-retest reliability for the initial version of SMSES-BC [24].

Construct and concurrent validity (Stage 3)

Sample

The sample consisted of 152 outpatients with breast cancer recruited from two teaching hospitals in southern and northern areas of Taiwan. The sampling frame and inclusion criterion matched with those of stage 2 (the pilot study). Participants included 152 women (100%) diagnosed with breast cancer. Participants' ages ranged from 30 years to 78 years old, with a mean age of 54.3 years (SD = 9.9 years). Most participants were married (71.7%), lived with others (77.6%), had an education level of primary school and below (24.3%), had a religion (87.5%), and were not working (66.5%). Participants were diagnosed breast cancer with a mean duration of 4.2 years (SD = 5.4 years). Around 64.7% of the participants had a diagnosis of metastatic breast cancer. All patients underwent the treatment with various therapeutic agents included chemotherapy (65.2%), hormone therapy (37.6%), and target therapy (24.9%).

Measures

In addition to the 34-item SMSES-BC, the General Self-Efficacy Scale (GSES) was used to establish concurrent validity with the SMSES-BC. The GSES is a 10-item scale designed to evaluate the