

CHAPTER 1

INTRODUCTION

Background and Significant of Research Problem

Breast cancer has become a prominent health concern for women in Thailand as the incidence and the mortality rate has increased each year. The incidence rate has increased from 16.3: 100,000 population in 1993 to 17.2: 100,000 population in 1996, and to 19.9: 100,000 population in 1999 (The Ministry of Public Health, 2005). Thai National Cancer Control Committee estimated that 7,000 cases of newly diagnosed breast cancer occurred in 2004 and will increase to 12,000 cases in 2008 (The Siriraj Cancer Center, 2004). Besides, 80% of women with breast cancer in Thailand were found to have the invasive stage due to the low rate of breast cancer screening (The Ministry of Public Health, 2002, 2005). In a related study, only 17.3% of women performed monthly breast self-examinations (Kengketkhit, Rabeab & Iemraksa, 1999). As such, breast cancer has become the first leading form of cancer among female cancers (Martin & Cheirsilpa, 2002; Thai National Cancer Institute, 2002) as well as the leading cause of premature death among Thai women (The Ministry of Public Health, 2002). Thus, breast cancer is a significant health problem in Thailand.

Regarding current treatment, research found that adding adjuvant chemotherapy to early stage of breast cancer treatment regimens reduces mortality rates (Early Breast Cancer Trialist's Collaborative Group 1992, 1998). However, this

treatment causes an increase in side effects including nausea, vomiting, pain and fatigue (Dimeo, Stieglitz, Novelli-Fischer, et al., 1999; Given, Given, McCorkle, et al., 2002; Richardson, 1995; Winingham, Nail, Barton, Burke et al., 1994).

Approximately 70 -100% of breast cancer patients undergoing treatment experience fatigue (Arkinson, Bersevick, Cella, et al., 2000; Dimeo et al., 1999), 30-50% experience pain (Miaskowski & Lee, 1999; Portenoy & Miaskowski, 1998), and 88% report nausea and vomiting (Glanz & Lerman, 1992). All of this has had a significantly negative impact on their ability to function normally and independently in their daily lives (O' Brien, 2003). However, fatigue was reported as being more adversely affected than pain (Kuuppelomaki & Lauri, 1998; Vogelzang, Breitbart, Cella, et al., 1997).

Fatigue has not only been shown to have considerable impact on all dimensions of quality of life (Ferrell, Grant, Dean, Funk & Ly, 1996; Frank-Stromborg & Wright, 1984), but also that it is the most disruptive and distressing symptom reported by women receiving adjuvant chemotherapy (Vogelzang, Breitbart, Cella, et al., 1997). Further, fatigue influences their sense of well-being, daily performance, activity of daily living, relationships with family and friends, and compliance with treatment (Chan & Molassiotis, 2000; Curt et al., 2000; Winingham, Nail, Burke, et al., 1994; Wu & McSweeney, 2001).

Although fatigue is reported to have a high prevalence and a large impact on women being treated for breast cancer, little is known about its causes. Fatigue is believed to be the result of multifactors (Demio et al., 1999; Smets et al., 1993). In order to gain a richer understanding and to develop appropriate intervention to reduce

fatigue in women with breast cancer, factors influencing fatigue should be considered and studied in terms of multiple factors.

A framework that has been proposed to explain the underlying mechanism of chemotherapy-induced fatigue, the Piper Integrated Fatigue (PIF) model (Piper, Lindsey & Dodd, 1987), suggests that fatigue is multidimensional, and describes fatigue as “a subjective feeling of tiredness that is influenced by the circadian rhythm; it can vary in unpleasantness, intensity, and duration” (Piper et al., 1987, p. 19). In contrast to tiredness, “subjective fatigue is perceived as unusual, abnormal, or excessive whole-body tiredness disproportionate to or unrelated to activity or exertion” (Piper, 1993, p. 286). The PIF model describes 14 patterns that are believed to influence fatigue (Piper et al., 1987).

According to the PIF model, patterns influencing fatigue among women with breast cancer receiving chemotherapy in this study can be classified into three main factors: physiological, psychological and social. Physiological factors that are proposed to correlate with fatigue include treatment patterns, change in energy and energy substrate patterns, oxygenation patterns, symptom patterns, and sleep and wake patterns that are represented by chemotherapy protocols, nutritional status, anemia, symptom distress, and sleep disturbance, respectively.

With regard to the chemotherapy protocol, previous studies show that breast cancer patients who received chemotherapy protocol containing anthracycline agents (adriamycin) perceived higher intensity of fatigue than those who did not (Berger, 1998). In addition, these agents had a positively direct effect on fatigue (Berger & Walker, 2001). Nutritional status, in terms of body mass index (Irvine et al., 1994) and anemia, represented by hemoglobin level (Lind et al., 2002), was shown to have a

negative relationship with fatigue in cancer patients receiving chemotherapy. Specific distress symptoms, such as severity of pain, had a positive correlation with fatigue in cancer patients both during (Blesch et al., 1991; Jacobsen et al., 1999) and after treatment (Bower et al., 2000; Okuyama et al., 2000). Severity of nausea and vomiting also showed a positive correlation with fatigue (Berger & Walker, 2001; Jacobsen et al., 1999; Pritsanapanurungsei, 2000; Stone et al., 1998). Lastly, sleep disturbance or sleep problems had a positive relationship with fatigue (Berger & Farr, 1999; Berger & Higginbotham, 2000; Dalopakarn, 2002; Jacobsen et al., 1999; Pritsanapanurungsei, 2000).

Psychological factors that influence fatigue were psychological disturbances (Piper et al., 1987). Anxiety and depression are common psychological disturbances in cancer patients (Andrykowski et al., 1998; Greenberg, 1998). Extensive evidence supports that anxiety and depression are positively associated with fatigue in cancer patients (Akechi et al., 1999; Boeckel et al., 1998; Dalopakarn, 2002; Jamar, 1989; Okuyama et al., 2000; Redeker et al., 2000).

Social factors influencing fatigue perception were dependent upon social and cultural determinants (Piper et al., 1987). Thailand has a uniqueness of social and culture. Therefore, it is necessary to take into account Thais' unique socio-cultural characteristics including family support, friend support, and Buddhist practices in this study.

Family support and friend support are types of social support that have been shown to help cancer patients cope with stressful events including treatment, and side effects of treatment (Piper et al., 1987). These kinds of support are outstanding social support in Thai culture. Thai families hold the expectation that all family members

will be cared for, especially the elderly and those who are ill (Phengjard, 2001).

Qualitative studies in Thailand reveal that family support and caring are essential for long life and survival especially of those who are seriously ill with breast cancer (Junda, 2002). In addition, support from family and friends is considered a major contributing factor to Thai's adaptation to their illness with breast cancer (Chanpuang, 1991; Chaithaneeyachati, 2002; Kaveevivitchai, 1993), contributing to decreasing psychological distress including anxiety and depression (Chanpuang, 1991; Kaveevivitchai, 1993). The availability and quantity of social support may have an important effect on subjective fatigue. However, limited studies have explored the effect of social support on fatigue in cancer patients (Jamar, 1989; Dalopakarn, 2002).

Buddhism is the major religion in Thailand, thus it plays an important role in Thais, especially when they become ill (Komin, 1990; Pongpruk, 1998). Buddhist values are profoundly integrated in all aspects of Thai society (Tongprateep & Tipseankhun, 2002). Thais learn and apply Buddhist practices from birth until death (Komin, 1990). Buddhist practices are defined as activities related to the Buddhist religion. When facing illness and distress symptoms including nausea, vomiting, pain, and sleep disturbance, Thais often employ Buddhist practices such as meditation to achieve mindfulness or inner freedom from their ailments (Chaithaneeyachati, 2002; Kaveevivitchai, 1993; Pongpruk, 1998). Buddhist practice with meditation facilitates the mind's capacity to affect bodily function (Buddhasa, n.d.; Dhammapitika, 2003) that results an increase of capabilities to control physiological and psychological symptoms (Ott, 2002; Tacon, 2003). In addition, Buddhist practices have been found to provide positive thoughts in women with gynecological cancer (Tiansawad & Jaruwacharapanichkul, 1997) and with breast cancer

(Chunlestskul, 1998). They help Thais cope with difficulties and suffering including anxiety and depression, and may in turn reduce fatigue in women with cancer.

Comparison of breast cancer studies using the PIF model and the Piper Fatigue Scale in the U.S. (Berger, 1998; Berger et al., 2002) and in Thailand (Pritsanapanurungsei, 2000) indicates that American breast cancer women receiving adjuvant chemotherapy perceived fatigue mean scores higher (4.55 to 5.90) than Thai breast cancer women (2.89 to 3.01). This difference may be related not only to the timing of measurement and the chemotherapy agents, but also to social and cultural variations between the United States and Thailand. Moreover, most of cancer-related fatigue studies in Thailand have been conducted in the context of fatigue patterns in various types of cancer including breast cancer (Pritsanapanurungsei, 2000), head and neck cancer (Saejew, 2001), and cervical cancer (Pharungskul, 2002), rather than in factors influencing fatigue. There were only two studies that examined factors related to fatigue in breast cancer patients (Dalopakarn, 2002; Pritsanapanurungsei, 2000); however, these studies did not focus on determining the direct and indirect effect of predictors on fatigue. Therefore, it is unclear how all these predictors interact to produce fatigue symptom. From literature review focused on fatigue in breast cancer in Thailand, there is limited information regarding the interaction between factors influencing fatigue, as well as cultural determinants affecting fatigue. Hence, developing a model for predicting fatigue in Thai women receiving adjuvant breast cancer chemotherapy has a crucial role in expanding fatigue knowledge on Thai women with breast cancer. Consequently, these findings may assist oncology nurses to assess women with breast cancer who are at risk for experiencing fatigue, as well as develop a fatigue symptom management program for further study.

Objective of the Study

The objective of this study is to determine the extent to which variables in the model for predicting fatigue including chemotherapy protocols, hemoglobin level, body mass index, pain, nausea and vomiting, sleep disturbance, family support, friend support, Buddhist practices, anxiety, and depression explain fatigue in Thai women with breast cancer during adjuvant chemotherapy.

Research Question and Hypotheses

Research Question

To what extent do chemotherapy protocols, hemoglobin level, body mass index, pain, nausea and vomiting, sleep disturbance, family support, friend support, Buddhist practices, anxiety, and depression explain fatigue in Thai women with breast cancer during adjuvant chemotherapy?

Research Hypotheses

The hypotheses derived from the model are:

1. Chemotherapy protocol containing adriamycin has a direct positive effect on fatigue.
2. BMI has a direct negative effect on fatigue.
3. Hemoglobin level has a direct negative effect on fatigue.
4. Pain has a direct positive effect on Buddhist practices, anxiety, depression, and fatigue.

5. Nausea and vomiting has a direct positive effect on Buddhist practices, anxiety, depression, and fatigue.
6. Sleep disturbance has a direct positive effect on Buddhist practices, anxiety, depression, and fatigue.
7. Family support has a direct negative effect on anxiety, depression, and fatigue.
8. Friend support has a direct negative effect on anxiety, depression, and fatigue.
9. Buddhist practices have a direct negative effect on anxiety, depression, and fatigue.
10. Anxiety has a direct positive effect on depression and fatigue.
11. Depression has a direct positive effect on fatigue.

Scope of the Study

This was a cross-sectional study conducted on women who received adjuvant chemotherapy for breast cancer at short stay service and day care service of two university medical centers in Bangkok, Thailand. Data were collected from January to August 2005.

Definition of Terms

Fatigue is a subjective, unusual, abnormal feeling of excessive physical and mental tiredness, disproportionate to or unrelated to activities or exertion that are influenced by the circadian rhythm and other factors and varying in duration and intensity (Piper, 1986, 1993). It interferes with an individual's ability to perform

usual functions. Fatigue is operationally defined as the response on the revised Piper Fatigue Scale (1998), which was translated into Thai by Pritsanapanurungsei (2000).

Thai women with breast cancer is defined as Thai women who have been diagnosed with breast cancer by a physician for the first time.

Adjuvant chemotherapy is defined as the use of intravenous antineoplastic agents in addition to surgical treatment for breast cancer to eradicate microscopic metastases and to prolong life. Adjuvant chemotherapy includes the CMF (cyclophosphamide, methotrexate, 5FU), CAF (cyclophosphamide, adriamycin, 5FU), and AC (adriamycin, cyclophosphamide) protocols.

Model for predicting fatigue is a model developed to predict fatigue, which is derived from the Piper Integrated Fatigue Model and from literature review, composed of 11 factors:

Chemotherapy protocol is defined as the protocol of adjuvant chemotherapy that is categorized as protocol containing with Adriamycin (CAF and AC protocol) and non-Adriamycin (CMF protocol).

Body mass index (BMI) is one of the parameters in evaluating nutritional status of cancer patients. BMI is calculated using the following formulation: $BMI = \text{weight (kg)}/\text{height (m}^2\text{)}$.

Hemoglobin level is one of the indicators of anemic status in cancer patients that reflects the oxygen-carrying capacity of the body. It is measured by laboratory analysis of hemoglobin. The unit of measurement is grams/deciliter (gm/dl.).

Nausea and Vomiting is a subjective feeling of an unpleasant sensation experience in the back of the throat and the epigastrium or the forceful expulsion of

the contents of the stomach, duodenum, or jejunum through the oral/nasal cavity (Rhodes & Watson, 1987). Operationally, it is defined as the sum of scores of nausea and vomiting items on the modified Symptom Distress Scale, which was modified from the Symptom Distress Scale (McCorkle & Young, 1978) and translated into Thai by the investigator.

Pain is a feeling of unpleasant severity of pain sensation. It is operationally defined as the response on one item of pain on the modified Symptom Distress Scale that has been modified from the Symptom Distress Scale (McCorkle & Young, 1978) and translated into Thai by the investigator.

Sleep disturbance is defined as a subjective experience of insufficient sleep during one week. It is operationally defined as the response on the General Sleep Disturbance Scale (Lee, 1992), which was translated into Thai by the investigator.

Anxiety is defined as a subjective mood disturbance that an individual feels, including uneasiness, tension, insecurity, nervousness, worry, and apprehension and relates to the feeling of uncertainty associated with the perception of real or imagined threat (Walker 1990). Operationally, anxiety is defined as the response on the anxiety subscale of the Hospital Anxiety and Depression Scale originally developed by Zigmond and Snait (1983), and translated into Thai by Nilchaikovit, Lortrakul and Phisansuthideth (1996).

Depression is defined as a subjective mood disturbance that includes feelings of sadness, inactivity, difficulty in concentrating, significant increase or decrease in appetite and time spent sleeping, or feelings of dejection and hopelessness. Operationally, depression is defined as the response on the depression

subscale of the Hospital Anxiety and Depression Scale originally developed by Zigmond and Snait (1983), and translated into Thai by Nilchaikovit, Lortrakul and Phisansuthideth (1996).

Family support is defined as an individual's perception of the provision of assistance given by family members in various categories, including five aspects: adaptation, partnership, growth, affection, and resolve/commitment (Smilkstein, 1978). Family support is operationally defined as the response on the Family Support APGAR Questionnaire developed by Smilkstein (1978) and translated into Thai by Malathum (2001).

Friend support is defined as an individual's perception of the provision of assistance given by friends in various categories, including five aspects: adaptation, partnership, growth, affection, and resolve/commitment (Smilkstein, et al., 1982). Friend support is operationally defined as the response on the Friend Support APGAR Questionnaire developed by Smilkstein and other (1982) and translated into Thai by Malathum (2001).

Buddhist practices are defined as the frequencies of activities related to the Buddhist religion that are Buddhists expected to perform. Buddhist practices are operationally defined as the response on the Buddhist Practice Scale developed by the investigator.