# Poor sleep quality, depression and hope before breast cancer surgery

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## ARTICLE INFO

## ABSTRACT

*Aim:* This study aims to identify the predictors of poor sleep quality and the associations between depression, hope and sleep in a sample of 156 women with breast cancer prior to surgery.

*Background:* The care and treatment of breast cancer is among the most important scientific challenges in public health. Sleep disturbances and depression are the important complaint of cancer patients. However, they are often neglected. Patients diagnosed with breast cancer also experience prejudice, fear of death, suffering, mutilation, fear of lymphedema, as well as feelings of social devaluation leading to hopelessness Several studies point to hope as an effective strategy to help patients cope with difficulties and achieve their goals, especially patients with cancer.

*Methods:* This is a report of baseline data extracted from a longitudinal study.

*Data collection tools:* Pittsburgh Sleep Quality Index, Beck Depression Inventory, and the Herth Hope Index. Data were analyzed with the Spearman's Rank Correlation test and Multiple Logistic Regression analysis.

*Results:* The majority of women had tumors in initial stages (78.7%), reported poor sleep quality (58.9%), and had moderate to severe or severe depression (27.2%). Significant correlations were found between hope and depression (Spearman r = −0.4341), and between sleep quality and depression (Spearman r = 0.3938). Significant associations were found between poor sleep quality and pain, symptoms of menopause and depression. Depression and symptoms of menopause were independent predictors of poor sleep quality.

*Conclusion:* The evaluation of sleep quality, depression and hope should be implemented in clinical practice. Increased hope lessens depression and may positively affect sleep quality, all of which improves quality of life for women with breast cancer.

## 1. Introduction and background

Breast cancer is the most widespread cancer in women in the world. Around 15 million new cases per year are estimated until 2020, both in the developed and in the developing countries (Global Health Estimates, WHO, 2013). Although breast cancer is thought to be a disease of the developed world, almost 50% of breast cancer cases and 58% of deaths occur in less developed countries (Brazil, 2014). In South America, it is the most common cancer among women, with an estimated risk of 65 new cases per 100,000 (Brazil, 2014).

Sleep disturbances are an important complaint of cancer patients. However, sleep disorders are often neglected (Dirksen, Belyea, & Epstein, 2009). Two studies report that sleep disturbance is associated with increased levels of fatigue, anxiety, and depression (Bardwell, Profant, Casden, et al., 2008; Beck et al., 2010). The prevalence of sleep-wake disturbances in breast cancer survivors is higher than in the general population, with a portion of patients stating these disturbances started after their diagnosis of cancer (Girschik, Heyworth, & Fritschi, 2013; Savard, Villa, Simard, Ivers, & Morin, 2011).

Women who were breast cancer survivors (BCS) had significantly higher Pittsburgh Sleep Quality Index (PSQI) global scores (0–21 points-higher scores indicate poorer sleep quality) when compared to women without breast cancer, indicating that BCS had poorer sleep quality (Otte, Carpenter, Russell, Bigatti, & Champion, 2010; Bertolazi, Fagondes, Hoff, et al., 2011). Additionally, significant correlates of poor sleep for BCS included hot flashes, poor physical functioning, depressive symptoms and distress (Otte et al., 2010).

Furthermore, sleep duration may be an influential factor in breast cancer risk. An important case-control study was conducted in a multi-state population of 4033 women with invasive breast cancer and 5314 community women without breast cancer (McElroy et al., 2006). The results of this study suggest that increasing sleep duration (9 h or more) was not associated with an increased breast cancer risk (O.R. = 1.13, 95% CI 0.93–1.37) (McElroy et al., 2006). In contrast, short duration of sleep (<7 h/night) was not substantially associated with increased risk (McElroy et al., 2006). Other authors reported that

consistent evidence was lacking between short or long sleep duration and the risk for breast cancer (Pinheiro, Schernhammer, Tworoger, & Michels, 2006).

Patients diagnosed with breast cancer also experience prejudice, fear of death, suffering, mutilation, fear of lymphedema, as well as feelings of social devaluation leading to hopelessness (Beck et al., 2010). Nevertheless, the emotional support received by the patient from their family or friends can help them to overcome the impact of the diagnosis and live with hope (Akechi, Okuyama, Akizuki, et al., 2007).

Several studies point to hope as an effective strategy to help patients cope with difficulties and achieve their goals, especially patients with cancer. (Sanatani, Schreier, & Stitt, 2008; Schjolberg, Dood, Henriksen, & Rustoen, 2011) Hope makes a difference for the terminally ill, contributing to the acceptance of living with the disease and its treatment (Herth & Cutcliffe, 2002; Schjolberg et al., 2011).

However, little is known about the association between hope and sleep quality or between hope and depression in women with breast cancer. First, the relationship between hope and sleep quality has not been investigated before, revealing a gap addressed by the present study. Regarding depression, a recent research points to a strong association between hopelessness and helplessness with Beck Depression score, principally in breast cancer patients (Eskelinen, Korhonen, Selander, & Ollonen, 2015). The authors emphasize that patients with breast cancer are especially prone to present depression in the early course of the disease, and this condition may lead them to postpone the search for diagnostic and for treatment of the tumor (Eskelinen et al., 2015). Other study with patients recently diagnosed with cancer (about 30% of them with breast cancer) showed that higher hope scores implied in lower scores of anxiety and depression (Peh et al., 2016).

This study aims to identify the predictors of poor sleep quality and the associations between depression, hope and sleep in a sample of 156 women with breast cancer prior to surgery. There is a gap in knowledge related to the cluster of the following symptoms: poor sleep quality, depression, and hope.

## 2. Methods

### 2.1. Sample and setting

This is an observational and cross-sectional study design utilizing the baseline data from a longitudinal study, in which a non-probabilistic sample of breast cancer patients were followed at three, six and twelve months after surgery to assess for the development of distant metastases. One hundred fifty-six women with breast cancer were interviewed one day before they underwent breast cancer surgery. All the women that met the inclusion criteria on the period defined for data collection were included in the study. They were admitted and had surgery in a public university hospital located in a city in southeastern Brazil. This hospital is recognized as a national center for the treatment of gynecological and breast cancer, and is a large hospital specialized in women's health (http://www.caism.unicamp.br/).

Participants were women aged 18 years or older and were diagnosed in the last three months with breast cancer at stages I, II or III (International Union Against Cancer, 2009). All women who met the inclusion criteria were invited to participate in this study. Exclusion criteria were Karnofsky scale under 70 (cares for self; unable to carry on normal activity or to do active work); clinical (such as mucositis, pain, nausea, dyspnea, vomiting) and emotional (crying, apathy, aggression) conditions, which would prevent subjects from taking part in an interview. These were evaluated from the interview on the moment of the data collection.

The Karnofsky Performance Scale Index allows patients to be classified as to their functional impairment. This can be used to assess the prognosis in individual patients. The lower the Karnofsky score, the worse the survival for most serious illnesses (Karnofsky & Burchenal, 1949).

### 2.2. Procedures and ethical considerations

The research project was approved by the Research Ethics Committee of the institutional affiliation of the authors (# 44169, 26/06/2012) and this followed the Declaration of Helsinki. Women were treated with dignity and respected for their autonomy. The researcher asked the potential participants if they felt comfortable answering questions at that time, and informed them that they were free to refuse participation. The women signed a written consent to participate in this research.

### 2.3. Instruments

The participants were interviewed one day before the breast cancer surgery. The following tools were used: socio-demographic and clinical characterization form, constructed by the authors; Pittsburgh Sleep Quality Index/PSQI (Buysse, Reynolds, Monk, et al., 1988); Beck Depression Inventory/BDI (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961); and the Herth Hope Index/HHI (Herth, 1992). The versions utilized were in the Portuguese language and have been validated for use in Brazil (Bertolazi et al., 2011; Gorenstein & Andrade, 1996; Sartore & Grossi, 2008).

The socio-demographic and clinical characterization form was previously used in a study about sleep quality in elderly people with cancer (Mansano-Schlosser & Ceolim, 2012). We used this tool to record socio-demographic and clinical data from the participants. It was adapted, improved, and underwent judges' evaluation for content validation.

The Pittsburgh Sleep Quality Index is a questionnaire that evaluates sleep quality and sleep disturbances present in the month prior to its application (Buysse et al., 1988). Answers to the questionnaire were collected when the woman was admitted on the ward. This tool has 19 questions that are grouped in seven components: subjective sleep quality, sleep latency, duration of sleep, efficiency, sleep disturbances, use of medicines for sleep, and daytime dysfunction. The global score varies from 0 to 21 points, with a score of >5 points as a cut-off point for poor sleep quality. Higher scores indicate poorer sleep quality (Bertolazi et al., 2011).

The Beck Depression Inventory (BDI) is a self-assessment measure of depression widely used in research and clinical settings. It must be stressed that BDI is not a diagnostic instrument, but a scale for measuring depressive symptoms intensity (Beck et al., 1961). In its structure, the BDI has a subgroup of cognitive-affective items (cognitive-affective subscale), and somatic and performance complaints (somatic and performance subscale). The score varies from 0 to 45 points. Higher scores indicate more severe depression (Gorenstein & Andrade, 1996). This is not a diagnostic instrument.

The Herth Hope Index (HHI) is a self-report scale designed to facilitate the assessment of hope at several intervals where levels of hope may be identified (Herth & Cutcliffe, 2002). There are 12 statements with responses on a Likert scale of 1–4: strongly disagree, disagree, agree and strongly agree. This tool was completed when the participant was admitted on the ward. The score varies from 12 to 48 points (Sartore & Grossi, 2008). The hope assessment timeframe is the exact moment that the tool was completed, and higher scores indicate stronger hope.

### 2.4. Data analysis

Data were entered into the program Microsoft Excel ® for Windows version 2007 (Microsoft Corporation Inc.) and afterwards were transferred to SAS version 9.2 statistical software for analysis. Data analysis included: descriptive statistics; Spearman's Rank Correlation test (Pagano & Gauvreau, 2004) to evaluate the correlation between the scores of instruments used to assess sleep quality, depression and hope; multiple logistic regression analysis to identify predictors of