



## Original Article

# Psychosocial correlates of sleep quality and architecture in women with metastatic breast cancer



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## ARTICLE INFO

## Article history:

Received 27 February 2013

Received in revised form 11 July 2013

Accepted 12 July 2013

Available online 5 September 2013

## Keywords:

Metastatic breast cancer

Polysomnography

Sleep quality

Sleep architecture

Depression

Women

## ABSTRACT

**Background:** Sleep disturbance is prevalent among women with metastatic breast cancer (MBC). Our study examined the relationship of depression and marital status to sleep assessed over three nights of polysomnography (PSG).

**Methods:** Women with MBC ( $N = 103$ ) were recruited; they were predominately white (88.2%) and  $57.8 \pm 7.7$  years of age. Linear regression analyses assessed relationships among depression, marital status, and sleep parameters.

**Results:** Women with MBC who reported more depressive symptoms had lighter sleep (e.g., stage 1 sleep;  $P < .05$ ), less slow-wave sleep (SWS) ( $P < .05$ ), and less rapid eye movement (REM) sleep ( $P < .05$ ). Single women had less total sleep time (TST) ( $P < .01$ ), more wake after sleep onset (WASO) ( $P < .05$ ), worse sleep efficiency (SE) ( $P < .05$ ), lighter sleep (e.g., stage 1;  $P < .05$ ), and less REM sleep ( $P < .05$ ) than married women. Significant interactions indicated that depressed and single women had worse sleep quality than partnered women or those who were not depressed.

**Conclusion:** Women with MBC and greater symptoms of depression had increased light sleep and reduced SWS and REM sleep, and single women had worse sleep quality and greater light sleep than married counterparts. Marriage was related to improved sleep for women with more depressive symptoms.

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## 1. Introduction

Women diagnosed with breast cancer have high rates of sleep disruption [1–5]. Sleep disturbance often begins before or during treatment and may continue long after treatment completion, often worsening for women with metastatic breast cancer (MBC) [6–8]. One recent study demonstrated that those with breast cancer had the highest number of sleep quality complaints among cancer patients [9]. The majority of studies examining sleep in women with breast cancer have relied on self-report or indirect measurement [10]. Relatively few studies have used polysomnography (PSG), the gold standard for objectively assessing sleep [10], to examine sleep patterns in individuals with breast cancer. Of the studies that utilized PSG, dysregulation of sleep architecture in cancer patients was evidenced by lower sleep efficiency (SE) [11], more time in lighter nonrapid eye movement (NREM) sleep (stages 1 and 2), and less time in deep NREM or slow-wave sleep (SWS) (stages 3 and 4), as well as less rapid eye movement (REM) sleep

than experienced by the general population [12]. However, another study found little change in PSG-assessed sleep before and after completion of chemotherapy [13]. Evidence regarding objective changes in sleep architecture of women with MBC is inconclusive and further study is warranted.

There is a well-described correlation between depression and sleep disturbance in the general population [14,15]. Among women with breast cancer, nearly 20–30% experience depression [2,16,17], a higher prevalence than that seen in the general population. Depression further increases as breast cancer advances [18,19]. Palesh et al. [8] found that higher baseline and worsening depression among women with MBC predicted progressive sleep problems and that sleep disruption was associated with autonomic dysregulation during the day, particularly loss of vagal tone [20]. Although many precipitating factors may engender sleep disturbance and depression in MBC (e.g., stress, pain) the physiologic or psychological changes underlying these phenomena are unknown.

In addition, the relationship of marriage and sleep quality in women with breast cancer has been understudied, with investigations primarily focusing on healthy adults. Studies have demonstrated that divorced women have higher rates of sleep

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disturbance and insomnia [21]. Further there is evidence that marital happiness is related to improved sleep quality in women, relative to those experiencing marital discord [22]. Spousal sleep problems also negatively affect sleep and mood as well as the health of their partners [23]. Thus marriage appears to be an important variable affecting sleep quality in cancer patients. We aimed to examine the relationship of marital status to sleep among metastatic breast cancer patients. Our study examined the relationship of depression and marital status with sleep parameters assessed by two nights of consecutive at-home PSG and one night of laboratory PSG. Our a priori hypothesis was that higher depression scores among women with MBC would be related to significantly greater sleep disturbance. Exploratory aims were to examine the role of a potential moderator, marital status, in relation to sleep quality and architecture. We explored potential interactions between depression and marital status as they related to sleep in women with MBC.

**2. Methods**

**2.1. Participants**

Predominately white women (88.2%) with MBC (N = 103) were recruited and consented to participate (Fig. 1). The women were postmenopausal and were between the ages of 45–75 years (mean age, 57.8 ± 7.7 years) (Table 1). They also had documented metastatic or recurrent breast cancer, with Karnofsky Performance Status Scale ratings of at least 70% (physical ability measure for medically ill patients) [24]. Participants were at least 2 months postchemotherapy or hormonal treatment. Women were excluded if they had (1) previous bilateral lymph nodes removal; (2) had active cancers (other than breast cancer) within the past 10 years; (3) had taken corticosteroids, glucocorticoids, or benzodiazepines within the week preceding and during their in-laboratory sleep study; (4) had a history of major psychiatric illness that required

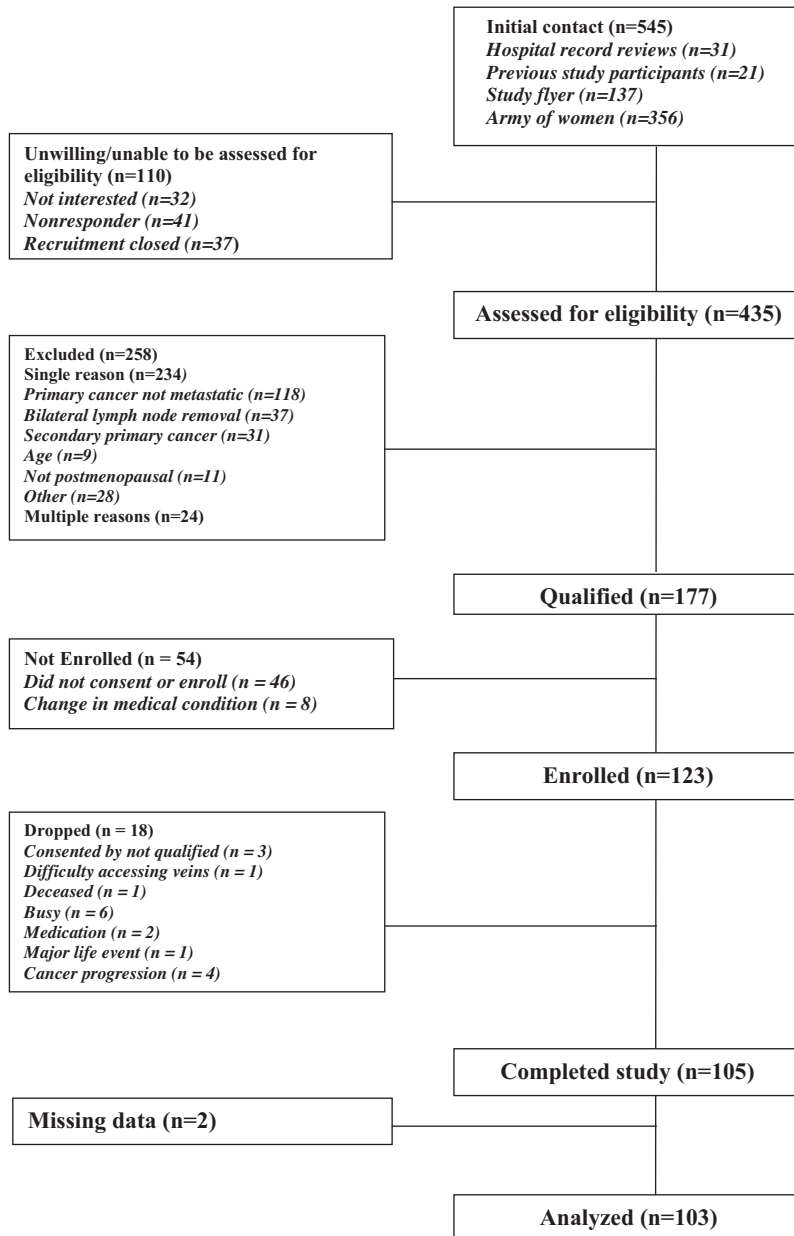


Fig. 1. Patient flow diagram.

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