A longitudinal study of phenotypic and symptom characteristics associated with inter-individual variability in employment interference in patients with breast cancer

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Objective

To evaluate for inter-individual differences in cancer's level of interference with employment among women with breast cancer from prior to through 12 months after surgery and identify phenotypic and symptom characteristics associated with higher levels of interference

Methods

This descriptive, longitudinal analysis is part of a NCI-funded study that evaluated for neuropathic pain and lymphedema in women who underwent breast cancer surgery. Patients were recruited from Breast Care Centers located in a Comprehensive Cancer Center, two public hospitals, and four community practices in the US.

Inclusion Criteria

Women ≥ 18 years of age who would undergo breast cancer surgery on one breast; were able to read, write, and understand English

Exclusion Criteria

Having breast cancer surgery on both breasts and/or had distant metastases at the time of diagnosis

Instruments

Interference with employment was assessed using a single item "To what degree has your illness or treatment interfered with your employment?" using a 0 (no problem) to 10 (severe problem) numeric rating scale (NRS). Other study variables including age, gender, marital status, level of education, ethnicity, employment status, annual household income, functional status, level of comorbidity, anxiety, depression, fatigue, attentional function, sleep disturbance, and breast pain were assessed prior to surgery. The employment interference item and the time varying covariates (i.e., radiation therapy, chemotherapy, hormonal therapy, complementary/alternative therapy, breast reconstruction, and re-excision or mastectomy of the affected breast) were assessed prior to surgery and at 1, 2, 3, 4, 5, 6, 8, 10, and 12 months after surgery.

Data Analysis

Descriptive statistics and frequency distributions were computed for sample characteristics and symptom severity scores using SPSS version 23 (IBM, Armonk, NY). Hierarchical linear modeling, based on full maximum likelihood estimation, was done using Stata/SE (StataCorp, 2017).

Results

Patients (n=387) were enrolled prior to breast cancer surgery and followed for 12 months. Patients' mean age was 55.0 (± 11.7) years with the majority having undergone breast conservation surgery (80.6%).

- The mean employment interference score prior to surgery was 3.2 (± 3.7 ; range 0-10). Unconditional model for employment interference demonstrated a decreasing linear trend (-.076/month) (Figure 1A).
- Younger age, lower income, higher pain intensity, and having an axillary lymph node dissection were associated with higher pre-surgical interference scores (Figure 1 B-E).
- Having a sentinel lymph node biopsy was associated with ongoing employment interference scores. Higher sleep disturbance scores were associated with both initial and ongoing employment interference scores (Figure 1 F-G).
- Receipt of chemotherapy, use of complementary or alternative therapies, and re-excision or mastectomy following surgery were significant time varying covariates.

Figure 1. Trajectory of cancer's interference with employment (A) and influence of age (B), income (C), axillary lymph node dissection (D), and pain (E) on inter-individual differences in the intercept parameters for cancer's interference with employment, and influence of sentinel lymph node biopsy (F) and sleep disturbance (G) on inter-individual differences in the slope parameters for cancer's interference with employment.

Take Home Messages

- Clinicians will benefit from increased knowledge of characteristics that place breast cancer patients at higher risk for employment challenges.
- In this study, that followed patients from prior to through 12 months after surgery, younger age, lower annual household income, being scheduled for an axillary lymph node dissection, breast pain prior to surgery, and higher level of sleep disturbance were associated with higher levels of employment interference.
- Clinicians can assess for these characteristics and make appropriate referrals to assist patients to minimize cancer's interference with their employment.

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