Factors associated with genetic testing in a cohort of breast cancer survivors

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**BACKGROUND**
Approximately 35% of individuals with breast cancer meet recognized guidelines for germline genetic testing based on the following criteria: young age of onset, triple-negative subtype, and positive family history. While recognized guidelines expanded opportunities for genetic testing, it is unclear how consistently these guidelines are being followed. It is also unclear which factors influence the decision to pursue genetic testing, as well as learning the results of testing. The purpose of this study is to examine factors associated with the receipt of genetic testing and the likelihood of learning the results of testing.

**STUDY QUESTIONS**
1. Do breast cancer survivors who receive genetic testing differ from those who do not?
2. Of breast cancer survivors who meet recommended criteria for screening, what factors are associated with a higher likelihood of actually getting testing?

**METHODS**
The Greater Plains Collaborative (GPC) Clinical Data Research Network (CDRN) Breast Cancer Group², sponsored by the Patient Centered Outcomes Research Institute (PCORI), conducted a comprehensive multi-site survey, Share Thoughts on Breast Cancer Study (see figure). Details of the GPC Share Thoughts on Breast Cancer Study have been previously described³.

![States with current GPC institutions are orange. White dots indicate Share Thoughts on Breast Cancer Study participating sites: Marshfield Clinic, Medical College of Wisconsin, U of Iowa, U of Kansas Medical Center, U of Minnesota, U of Nebraska Medical Center, U of Texas Southeastern Medical Center, U of Wisconsin](Image)

Participants (n=1235) were women >18 years, with microscopically-confirmed, stage 0-3 breast cancer, diagnosed January 2013 to May 2014. Questionnaire data were linked to tumor registry data for those who consented to access their medical record (n=835). Exclusion criteria: diagnosed with lobular carcinoma in situ, prior diagnosis of cancer per tumor registry records, and known to be deceased at the time the sample was selected.

Participants who underwent genetic testing were identified by their response to the following survey question: Did you have or are you planning to have genetic testing on a blood test or on your cancer tissue itself? Participants were asked to report whether they already had genetic testing or if they knew the results of the test by responding to one of the following options: Negative, Positive, Ambiguous or Uncertain significance, or Don’t Know.

Various factors were examined for their association with the likelihood that a woman received genetic testing. Chi-square tests and logistic regression models were used to assess the following factors: age at diagnosis, race, marital status, family income, education, insurance, family history of breast cancer, self-reported quality of life and emotional well-being, health literacy, and preferred decision-making style.

**RESULTS**
- Of the 1,235 participants surveyed, the median age at diagnosis was 59 years, 90.4% were white non-Hispanic and white Hispanic, 45.2% had a 4-year college degree or more, and 58.9% had private insurance.
- 486/1235 (39%) underwent genetic testing with an additional 53 (4%) planning to in the future.
- 8% (39) reported having a deleterious mutation with 7 participants tested not knowing the results of their genetic testing.
- Of participants who received genetic testing (as defined below):
  - 74.8% (age <50 years) and 89.3% (age <45 years) reported no family history of breast cancer
  - 86.7% (age <50 years) and 87.5% (age <45 years) reported 1 relative with breast cancer
- Of survivors <60 years with triple negative tumors, 75% reported undergoing genetic testing.
- Factors not significantly associated with receipt of genetic testing results:
  - Quality of life (p=0.6)
  - Emotional well-being (p=0.8)
  - Health Literacy
    - Composite score (p=0.7)
  - Problems understanding medical statistics (p=0.7)
  - Preferred decision making style (p=0.8)

**REFERENCES**

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