

RESEARCH ARTICLE

Relationships Between Cause of Cancer and Breast Cancer-Related Factors in Breast Cancer Survivors

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Abstract

Aims: The purposes of this study were to (1) to identify the causes of cancer in breast cancer survivors in Taiwan; and (2) to investigate the influence of demographic characteristics and breast cancer-related factors on the cause of cancer. **Materials and Method:** This study details the related investigative results on survivors with breast cancer using a descriptive and correlational design. A convenience sampling approach was employed. A structured questionnaire was used to assess the participants. **Results:** A total of 230 breast cancer survivors completed the questionnaire. Low-scoring cause of cancer participants were older adults (OR = 2.49, $p < 0.05$) who were already of menopausal status (OR = 2.28, $p < 0.05$). Around 72% of participants agreed high responsibility. Our breast cancer survivors felt stress had caused their breast cancer. **Conclusions:** These findings are helpful in understanding the relationship between cause of cancer and related factors in breast cancer survivors.

Keywords: Breast cancer survivors' - cause of cancer - Taiwan

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Introduction

Each year, about 1.38 million people are diagnosed with breast cancer global, and its annual incidence is increasing (Jemal et al., 2011). Many cancer patients will introspection on the cause of cancer after diagnosis. Breast cancer have been recognized, that personal characteristics including age at menopause, parity, age of first and subsequent pregnancies, breastfeeding, exogenous estrogen use, working, body mass index (BMI), and alcohol consumption. These high-risk factors may promote breast cancer development (MacMahon, 2006; Barnett et al., 2008; Ferrucci et al., 2011; Panjari et al., 2011; Turner, 2011). Other critical factors associated with breast cancer include stress, hormone therapy, genetics, environmental, diet, aging, smoking, alcohol, lack of exercise, that cause of breast cancer (Stewart et al., 2001; Wang et al., 2010; Ferrucci et al., 2011; Panjari et al., 2011). Numerous studies have shown that almost half of the women studied had abnormal BMI during the year preceding their breast cancer diagnosis (Kacem et al., 2010; Litton et al., 2011; Yaw et al., 2011).

Women endorsed the following causes of breast cancer, respectively: heredity (84.4%), diet or eating habits (46.4%), pollution in the environment (57.6%), aging (48.8%), alcohol (29.9%), smoking (58.3%), stress (27.5%), and lack of exercise (35.7%) (Wang et al., 2010). Furthermore, previous studies have reported stress (58.1%) as the most commonly cited reason, followed by previous use of hormone therapy (17.0%) and a family history of cancer (9.8%) (Panjari et al., 2011). Parkin et al. (2011)

estimated that 42.7% of incident cancer cases predicted in the United Kingdom during 2010 were connected to the 14 major lifestyle and environmental factors. These factors include tobacco use, alcohol consumption, diet (consumption of meat, fruit and vegetables, fiber, and salt), being overweight, lack of exercise, occupation, infections, radiation exposure, hormone replacement therapy, and reproductive history (breastfeeding). Overweight and obesity are the most crucial factors that affect breast cancer (Parkin et al., 2011). Cancer patients frequently experience insomnia. Cancer patients generally have difficulty sleeping (Epstein & Dirksen, 2007). Between 30% and 73% of cancer patients experience difficulty sleeping (Anderson et al., 2003). Specifically, breast cancer survivors are most likely to experience sleep disorders (Carpenter et al., 2004; Epstein & Dirksen, 2007). Causal attributions may impact cancer survivors' quality of life, and psychosocial adjustment (Stewart et al., 2001; Ferrucci et al., 2011). Therefore, because cancer risk factors may be related to survival and prognosis, a greater understanding of which cancer survivors identify modifiable causal attributions for their disease could be appropriate to successfully promoting healthy behavior (Ferrucci et al., 2011; Stewart et al., 2001).

Previous studies have discussed that the cause of cancer and critical factors associated with breast cancer (Stewart et al., 2001; Wang et al., 2010; Ferrucci et al., 2011; Panjari et al., 2011). However, the report that identified relationships between causes of cancer and breast cancer-related factors among breast cancer survivors are insufficient. Therefore, the purposes of this

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study were as follows: (1) to identify the causes of cancer in breast cancer survivors in Taiwan; and (2) to investigate the influence of demographic characteristics and breast cancer-related factors on the cause of cancer. Our findings can serve as a reference for future breast cancer prevention education for women and assist them in healthy living.

Materials and Methods

Design

This study details the related investigative results on survivors with breast cancer using descriptive and correlational design. A convenience sampling approach was employed to acquire participants in this research from breast cancer patient support groups at 10 hospitals in Taiwan. A structured questionnaire was used to conduct face-to-face interviews. The 5 interviewers were nursing students who received training prior to conducting the interviews.

Samplings

The study participants were recruited from supportive groups of breast cancer patients from ten hospitals in Taiwan. The inclusion criteria were (a) age greater than 18 years, (b) able to communicate in Chinese. The research proposal was approved by the ethics committee of the

Institutional Review Board (IRB). A total of 230 subjects were interviewed based on the Gorsuch recommendation (Gorsuch, 1983).

Instruments

The participants were requested to provide demographic information and a cause of cancer comprising 46 Likert scale items (rated from strongly oppose to strongly agree). This was used to evaluate the 13 dimensions for cause of cancer. Total scores range from 46 to 230. The participants were instructed to complete, general demographic information and the cause of cancer scale. Most items for the questionnaire were obtained from literature and existing questionnaires. We conducted a content validity assessment with professional experts. We invited three cancer nursing professionals and two cancer clinicians to conduct professional-expert content validity review and add, decrease, or revise the items using a content validity index (CVI) (Lynn, 1986).

Demographic (e.g. age, education, marital status, religion, employment status, income, family history of cancer, menopausal status, parity experience, breastfeeding experience) and clinical information (e.g. cancer stage, years since initial diagnosis, BMI) was collected.

Cause of Cancer Scale: This scale includes 46 items

Table 1. Relevance of Demographic Characteristics and Cause of cancer to breast cancer survivors (n=230)

| Variables | Subject | | Low (≤ 3) | | high (> 3) | | χ^2 | p | Odds Ratio | 95% Confidence Interval |
|---------------------------------------|---------|------|------------------|------|----------------|------|----------|------|------------|-------------------------|
| | n | % | n | % | n | % | | | | |
| Age (years) | | | | | | | 8.54 | 0.00 | | 1.34-4.62 |
| >50 | 173 | 75.2 | 127 | 80.9 | 46 | 63.0 | | | 2.49 | |
| ≤ 50 | 57 | 24.8 | 30 | 19.1 | 27 | 37.0 | | | 1 | |
| Senior education | | | | | | | 3.74 | 0.05 | | 0.99-3.43 |
| No (≤ 9 years) | 80 | 34.8 | 60 | 38.7 | 20 | 26.7 | | | 1.84 | |
| Yes (> 9 years) | 150 | 65.2 | 95 | 61.3 | 55 | 73.3 | | | 1 | |
| Marital Status | | | | | | | 0.26 | 0.61 | | 0.62-2.28 |
| Married | 175 | 76.1 | 120 | 76.4 | 55 | 75.3 | | | 1.08 | |
| Others | 55 | 23.9 | 37 | 23.6 | 18 | 24.7 | | | 1 | |
| Employment Status | | | | | | | 1.13 | 0.29 | | 0.76-2.57 |
| Unemployed | 168 | 75.2 | 118 | 75.2 | 50 | 68.5 | | | 1.39 | |
| Employed | 62 | 24.8 | 39 | 24.8 | 23 | 31.5 | | | 1 | |
| Religious | | | | | | | 0.09 | 0.77 | | 0.62-1.90 |
| No | 44 | 47.8 | 30 | 19.1 | 14 | 19.2 | | | 0.89 | |
| Have | 186 | 52.2 | 127 | 80.9 | 59 | 80.8 | | | 1 | |
| family history of cancer | | | | | | | 1.70 | 0.19 | | 0.82-2.61 |
| Yes | 89 | 38.7 | 68 | 43.3 | 25 | 34.2 | | | 1.47 | |
| No | 141 | 61.3 | 89 | 56.7 | 48 | 65.8 | | | 1 | |
| Childbirth experience | | | | | | | 0.23 | 0.63 | | 0.36-1.87 |
| Yes | 202 | 87.8 | 139 | 88.5 | 63 | 86.3 | | | 0.82 | |
| No | 28 | 12.2 | 18 | 11.5 | 10 | 13.7 | | | 1 | |
| Breastfeeding experience | | | | | | | 1.14 | 0.29 | | 0.77-2.40 |
| Yes | 100 | 43.5 | 72 | 45.9 | 28 | 38.4 | | | 1.36 | |
| No | 130 | 56.5 | 85 | 54.1 | 45 | 61.6 | | | 1 | |
| Menopausal status | | | | | | | 5.55 | 0.02 | | 1.14-4.57 |
| Yes | 195 | 84.8 | 136 | 86.6 | 54 | 74.0 | | | 2.28 | |
| No | 35 | 15.2 | 21 | 13.4 | 19 | 26.0 | | | 1 | |
| Cancer stage | | | | | | | 0.08 | 0.77 | | 0.62-1.90 |
| $\leq I$ | 110 | 47.8 | 72 | 45.9 | 32 | 43.8 | | | 1.09 | |
| $> I$ | 120 | 52.2 | 85 | 54.1 | 41 | 56.2 | | | 1 | |
| Years since initial diagnosis (years) | | | | | | | 2.37 | 0.12 | | 0.31-1.15 |
| ≤ 5 | 49 | 21.3 | 29 | 18.5 | 20 | 27.4 | | | 0.60 | |
| > 5 | 181 | 78.7 | 128 | 81.5 | 53 | 72.6 | | | 1 | |
| BMI | | | | | | | 0.12 | 0.76 | | 0.49-1.66 |
| ≤ 24.0 | 158 | 66.9 | 107 | 68.2 | 51 | 69.9 | | | 0.90 | |
| > 24.0 | 72 | 33.1 | 50 | 31.8 | 22 | 30.1 | | | 1 | |

Table 2. The Top Five Items (n=230)

| variables | Mean±SD |
|--------------------------|-----------|
| 24. high responsibility | 3.99±0.91 |
| 23. high stress levels | 3.81±1.08 |
| 25. fast-paced lifestyle | 3.79±1.00 |
| 29. perfectionism | 3.71±0.93 |
| 20. difficulty sleeping | 3.41±1.17 |

Table 3. The Top Five Dimensions (n=230)

| variables | Mean±SD |
|------------------------------|-----------|
| stress | 3.72±.82 |
| lack of exercise | 3.34±1.18 |
| difficulty sleeping | 3.30±1.04 |
| dietary problems | 3.01±0.80 |
| pollution in the environment | 2.95±1.01 |

that are rated based on five grades: strongly oppose - strongly agree (1-5). This was used to evaluate the thirteen dimensions of cause of cancer. The range of the total score is from 46 to 230, with a higher score indicating a higher cause of cancer level. Cronback's alpha of the Chinese version of the cause of cancer scale is 0.96.

Analysis

SPSS 20.0 (SPSS, Inc., Chicago, IL, USA) for Windows software analyzed data to decide demographic characteristic percentages, means, standard deviations (SD), and related factors. The chi-square (χ^2) test analyzed the odds ratio (OR) to explain the relationship between cause of cancer and its related factors.

Results

Demographic Characteristics, Related Factors, and Cause of Cancer

A total of 230 (92%) of the 250 distributed questionnaires distributed to breast cancer survivors were completed and returned. The average participant age is 55 years (SD=8.9 years), and the average time since initial diagnosis is 7.9 years.

The average participant BMI is 22.9. Among these participants, 65% received an education above the junior high school level and 76% of participants were married. Seventy-five (75%) participants reported being unemployed, 88% had experienced childbirth, and 85% of participants were in the menopausal status. Only 29% of participants had a BMI above 24. Low-scoring cause of cancer participants were older adults (OR = 2.49, $p < 0.05$) who were already of menopausal status (OR = 2.28, $p < 0.05$) (Table 1).

This cause of cancer scale includes 46 items. Their mean cause of cancer scale was 2.79 (SD=.64). Numerous women agreed or strongly agreed that personal behaviors such as high responsibility (72.0%), high stress levels (65.3%), fast-paced lifestyle (60.6%), perfectionism (58.9%), and difficulty sleeping (51.3%) play a role in causing breast cancer. The top five items (such as: high responsibility, high stress levels, fast-paced lifestyle, perfectionism, and difficulty sleeping) (Table 2). The cause of cancer scale includes 13 dimensions. The top five dimensions (such as: stress; lack of exercise; difficulty

sleeping, dietary problems, pollution in the environment) (Table 3).

Discussion

In this study, 66.9% of participants' BMI levels were ≤ 24.0 . This result is not supported by those of other studies (Kacem et al., 2010; Yaw et al., 2011). The majority of participants in this study had an acceptable BMI. It is possible that Western countries experience greater problems with obesity than Asian countries. Furthermore, the results of this study show that factors associated with cause of cancer include age and menopausal status. These results are supported by several other studies (MacMahon, 2006; Barnett et al., 2008; Ferrucci et al., 2011; Panjari et al., 2011; Turner, 2011). Breast cancer survivors in this study agreed or strongly agreed that personal behaviors such as high responsibility, high stress levels, fast-paced lifestyle, and perfectionism play a role in causing breast cancer. These are all attributable to stress. Moreover, the breast cancer survivors in this study reported that stress had caused their breast cancer, these results were consistent with many studies (Stewart et al., 2001; Panjari et al., 2011). They reported difficulty sleeping and that a lack of exercise, dietary problems, and air pollution contributed to their breast cancer. All of these observations are supported by numerous studies (Stewart et al., 2001; Anderson et al., 2003; Carpenter et al., 2004; Dirksen & Epstein, 2007; Wang et al., 2010; Ferrucci et al., 2011; Panjari et al., 2011). Causal attributions may impact cancer survivors' quality of life (Stewart et al., 2001; Ferrucci et al., 2011). Therefore, understanding and assessing causal attributions and more general existential questions regarding diagnosis could help in our understanding of survivors' modification and psychosocial well-being (Stewart et al., 2001; Ferrucci et al., 2011). Therefore, breast cancer survivors should maintain a normal lifestyle and create a positive attitude toward coping with cancer (Lu et al., 2010).

This study had limitations. The cancer survivors should be listed in the ranking the perceived causes of cancer, and to facilitate the ranking analysis. Future research can consider ranking the perceived causes of cancer.

In conclusion, low cause of cancer breast cancer survivors were older and already in the menopausal status. Around 72% of subjects agreed high responsibility. Our breast cancer survivors felt that stress had caused their breast cancer. Breast cancer survivors reported strong personal opinions toward attribution. These results provide insight for nurses working in breast cancer centers, breast cancer researchers, and breast cancer educators.

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