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### **Determinants of Cognitive Representations in Cancer**

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#### **ABSTRACT**

People have different interpretations for their illness. The etiological factors responsible for any disease vary from person to person even with the same disease. Likewise, the perceptions of disease causes, response to treatments and recovery all are directly related to the multitude of factors. The foregoing article reviews literature that takes stock of the determinants of conscious behavior of people who are diagnosed with cancer or at risk of cancer. Psychological, social, cultural along with physical characteristics and the stage of disease at the time of diagnosis, the treatment options, their availability, affordability all play pivotal role in cancer behavior. Age gender, socioeconomic status also has their inputs in the cancer behavior.

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#### **INTRODUCTION**

Breast cancer is a common cancer for women both in many parts of the world including India. Cancer is an important public health problem with 8 to 9 lakh cases occurring every year. At any point of time, it is estimated that there are nearly 25 lakh cases in the country. Every year about 4 lakh deaths occur due to cancer. Breast Cancer is the most common malignancy of women worldwide accounting for 23% of all newly diagnosed cancer cases. It is also the leading cause of cancer mortality, representing 14.1%.<sup>1</sup>

Mostly common cancers in women are cancer of uterus, cervix, breast and oral cavity. Cancer of cervix and breast in females account for over 50% of all cancer deaths in India. Studies continue to uncover lifestyle factors and habits that alter breast cancer risk. With increases in the number of cancer survivors, many persons now experience cancer as a chronic disease followed by adaptation to a new reality of what is normal in their lives. In response, cancer survivorship researchers have begun attending to the multidimensional needs of survivors, including the need to promote optimal psychological adaptation and health.<sup>2</sup>

A diagnosis of breast cancer regardless of the stage can be stressful, impacting on multiple spheres of life, disrupting physical status, emotional and spiritual well-being and personal relationships for the patient and family. For patients diagnosed in the early stages, the stress of coming to terms with the diagnosis, the experience of complex and usually long treatments, and the side effects of the different treatment modalities is evident. For those diagnosed in the late stages, have to come to terms with their diagnosis, the fact that they will have to receive palliative as opposed to curative care and the fears and uncertainty about end of life.<sup>3</sup>

## **DETERMINANTS OF COGNITIVE REPRESENTATIONS OF ILLNESS**

Individuals at high risk for developing breast and/or ovarian cancer are faced with difficult decisions regarding genetic testing, cancer prevention and/or intensive surveillance. Large inter-individual differences exist in the uptake of these health-related services.<sup>4</sup>

The self-regulation model of illness representations four interrelated attributes of the cognitive illness representation of hereditary breast/ovarian cancer are described: causal beliefs concerning the disease, perceived severity, perceived susceptibility to the disease and perceived controllability.<sup>5</sup>

According to Leventhal's self-regulatory model, an individual's responses to illness are based upon cognitive representations of illness consisting of five components: identity, causes, time-line, consequences, and cure or controllability.<sup>6</sup>

A study provides first evidence that worry can be an influential factor in the formation of negative cognitive representations of illness in individuals facing a life-threatening illness such as lung cancer. Worry was significantly related to multiple known domains of cognitive representations of illness, and certain relationships became stronger after surgery. Importantly, higher worry was related to worse or more threatening aspects in the after domains: identity (symptoms); psychological, behavioral risk, and immune attributions; illness time line; treatment control; illness coherence; and emotional representations.<sup>7</sup>

A study investigated cognitive representations and psychological effects of being 'at-risk' for cancer. Perceived personal risk for cancer and causal attributions for cancer were measured in four groups: women identified as carriers of mutations in breast/ovarian cancer genes BRCA1 BRCA2, habitual smokers, X-ray technicians, and an average-risk group. Despite differences in awareness of their risk status and perceived risk for cancer, the groups did not differ in health anxiety, cancer worry interference, and self-assessed health.<sup>8</sup>

A study analysis revealed that only greater beliefs in the controllability of lymphedema and self regulatory ability, as well as greater knowledge, were predictive of greater adherence to risk management strategies. The study highlights the importance of underlying beliefs as determinants of whether a woman who is informed and knowledgeable about lymphedema risk and its management will undertake the recommended risk management actions. Along with raising awareness of lymphedema and its risk management, health professionals should promote positive beliefs among women regarding the controllability of lymphedema through early detection/early, treatment approaches. In addition, educational approaches should aim to enhance a woman's beliefs in her ability to adhere to these risk management recommendations over time.<sup>9</sup>

A study investigated whether participation in screening for cancer varies according to cognitive ability and personality and reported that better cognitive function and greater conscientiousness may be linked with a slightly increased likelihood of participation in bowel cancer screening.<sup>10</sup>

Studies have shown that cognitive ability explains at least part of the relationship between health literacy and health outcomes, and that cognitive ability and conscientiousness have been linked with future income. There is considerable evidence that cognitive function tends to be poorer in those with more deprived socioeconomic backgrounds and some evidence—rather less consistent—that personality traits vary by socioeconomic position. Several studies have found that

cognitive ability and personality partially explain links between socioeconomic position and mortality.<sup>11</sup>

A study found theoretically congruent cross-sectional associations between illness representations and mood disturbance. Support was found for a possible path whereby higher denial and avoidant coping might mediate the relationships between cyclical timeline and illness coherence representations and more negative mood.<sup>12</sup>

A study took a theoretical approach using Leventhal's Self-Regulatory Model (SRM) to understand variation in distress levels. The study examined the associations between perceptions of breast cancer and distress in women at increased risk of breast cancer. Women at increased risk of breast cancer showed comparable levels of general distress but significantly higher levels of cancer specific distress than the comparison group. There were few differences in illness perceptions between the samples, although a number of cognitive perceptions of breast cancer were related to both general and cancer specific distress in the increased risk sample, but not in the comparison sample. The results suggest that the SRM provides a useful framework to explore the psychological response to genetic risk.<sup>13</sup>

A study reported that perceived impact was consistently associated with participants' indices of negative emotional well-being. Contrary to the hypothesized model, coping did not mediate the association between illness representations and emotional well-being in given sample of diabetic patients. It found that coping did not appear to be a robust predictor of emotional well-being.<sup>14</sup>

Cognitive impairment is being acknowledged as an after-effect of cancer treatment, and is also commonly known as 'chemo fog' or 'chemo brain'. Matsuda et al. reported that chemotherapy-induced cognitive deficits occurred in 10–40% of all cancer patients, with up to 23% in women with breast cancer. Overall, the estimated prevalence of chemo brain varies in the literature from 15% to 70%. The etiology of chemo brain remains unknown. However, there are indications that it may be due to toxicity from chemotherapy agents, especially high dose treatments. Studies also suggest cognitive changes may be due to a combination of psychological and medical factors associated with adjuvant systemic therapy (e.g. low oestrogen and progesterone from chemotherapy) as well as anticancer hormonal treatments (e.g. tamoxifen or aromatase inhibitors). Cognitive impairments have also been shown to occur prior to chemotherapy, making it difficult to determine what is actually due to the chemotherapy. Cognitive performance can also be influenced by common problems faced by cancer survivors that may include pain, insomnia, depression and fatigue.<sup>15</sup>

## **CONCLUSION**

The review concludes that cancer behavior, just as other illness behavior can be explained with Leventhal's self-regulatory model, where an individual's responses to illness are based upon cognitive representations of illness consisting of five components: identity, causes, time-line, consequences, and cure or controllability. Variety of modifiable and non-modifiable factors can be grouped and these factor groups vary from person to person.

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