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A Review Article On Causing Agents Of Cancer And How Mental Health Cause Cancer

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Abstract : We looked through a number of electronic databases for pertinent evaluations on anxiety, depression, and cancer. A number of topics are discussed, including the incidence of anxiety and depression, prospective care and treatment choices, and variables that may lead to the development of common mental disorders among cancer patients. Additionally, we present a number of suggestions for more study. Patients with breast cancer frequently have anxiety and depression as co-morbidities. It's uncertain if anxiety and depression are linked to the development or death of breast cancer.

Our research emphasizes how important anxiety and depression are as a stand-alone predictor of breast cancer survival and recurrence. A beneficial approach that improves outcomes for breast cancer patients with mental illnesses should be the main focus of future research.

With more individuals living with and beyond cancer, there is an urgent need for research into the potential long-term and late consequences of cancer treatment on mental health as well as ways to prevent them.

Young adult mental health issues have been linked to behaviors and potentially changeable factors that raise the risk of cancer. Efforts to prevent cancer and promote health must attend to mental health disparities to meet the needs of young adults.

IndexTerms **- Cancer, mental health, depression, anxiety, and multimorbidity**

I.INTRODUCTION

Cancer is the uncontrolled growth of abnormal cells anywhere in the body. We refer to these aberrant cells as tumor cells, malignant cells, or cancer cells. These cells can infiltrate normal body tissues. When damaged or unrepaired cells do not die and become cancer cells and show uncontrolled division and growth - a mass of cancer cells develop. Frequently, cancer cells can break away from this original mass of cells, travel through the blood and lymph systems, and lodge in other organs where they can again repeat the uncontrolled growth cycle. When the cancer cell move to another area and grow there is termed as metastatic spread or metastatis.

1.1.Risk factors

Cancer will manifest later in life and the proportion of cancer resulting from endogenous processes will rise to the amount that the main external risk factors for cancer—smoking, chronic inflammation, and an unbalanced diet are reduced. Sun exposure the primary cause of skin cancer is sun exposure, with melanoma being the most serious type. Early life exposure, especially when it is high enough to result in burns, seems to be the main contributing factor. Some of them are as follows

1.Ionizing Radiation

2.Chemical substances

3.Dietary fact- Meat, energy balance, fat, protein, alcohol, nitrites.

4.Estrogens, viruses, stress and age

5.Heredity

1.2.Types of cancer :- There are three main types of cancer are as follows

1.Solid cancer

2.Blood cancer

3.Mixed cancer

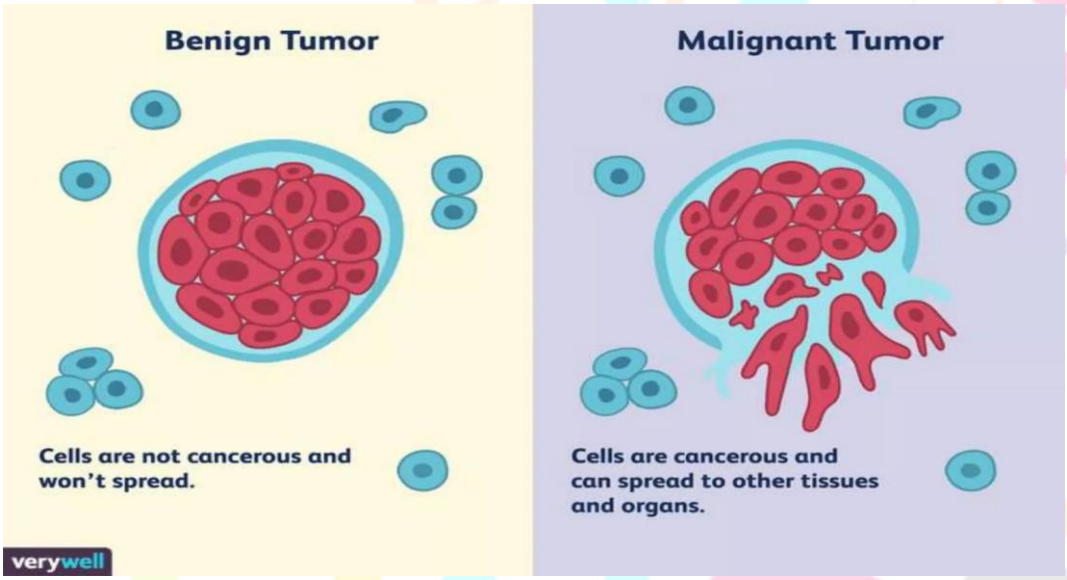


Figure 1.1

1.3.Causing agents of cancer

The reasons behind cancer offers a foundation for comprehending the possibility of cancer prevention. If a cause is identified, it is much simpler to determine if it can be easily avoided (tobacco smoking, for example) or not (ionizing radiation in the atmosphere). The three leading types of cancer-causing infections—hepatitis B virus (HBV) and hepatitis C virus, human papillomavirus (HPV), and Helicobacter pylorifollow tobacco in importance as risk factors for cancer incidence in developing countries. The main causing agents are –

• Genetic mutations

• Environmental exposures – Radiations, Chemical carcinogens, infections, pollution

• Smoking and alcohol consumptions

• Diet and sun exposures

• Lifestyle and tobacco

• Lack of physical activity

• Depression and anxiety

1.4.Sign and Symptoms of Cancer

• **Unexplained Weight reduction:** Significant weight reduction that happens quickly and without effort.

• **Fatigue:** A chronic, inexplicable feeling of exhaustion that does not go away with rest.

• **Fever:** An inexplicable or persistent fever that doesn't go away.

• **Night Sweats:** Prolonged perspiration that isn't caused by any other factors, particularly at night.

• **Swelling or lumps:** Any odd or new swelling or lump, particularly if it continues.

• **Skin Changes:** New skin growths, unhealing skin lesions, or modifications to moles.

• **Unusual or excessive bleeding or bruising:** that don't have a known cause are referred to as unexplained bleeding or bruises.

• **Pain:** that doesn't go away or is abnormally severe, particularly when it occurs in a new place, is referred to as persistent pain.

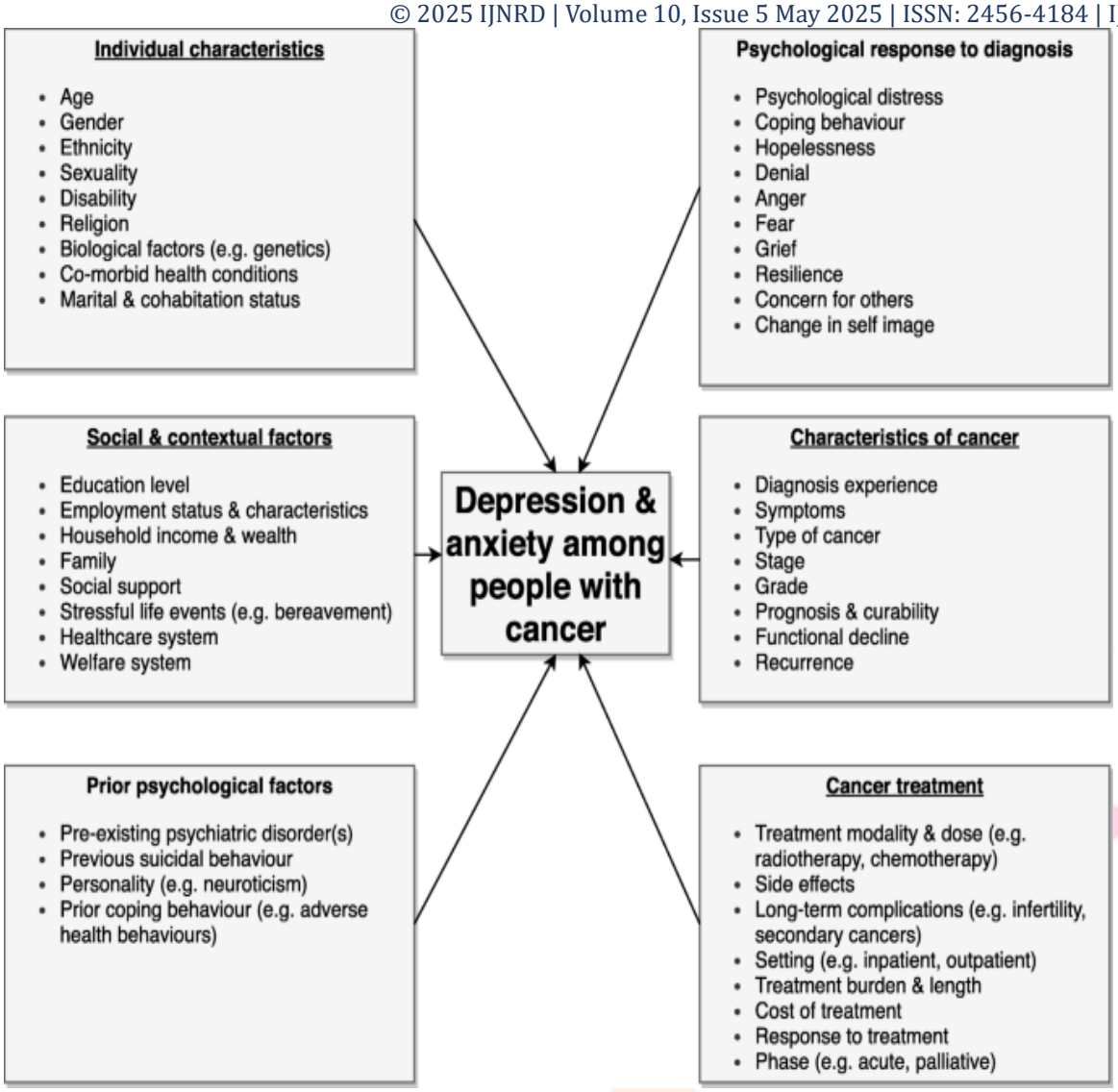
• **Modifications to Bladder or Bowel Habits:** Modifications to the ease, regularity, or consistency of urination or bowel movements.

• **Swallowing difficulties:** Constant trouble swallowing liquids or meals.

2.1.Mental health and stress cause cancer

Poor physical health and mental health issues frequently co-occur: Having been diagnosed with diabetes, heart disease, cancer, asthma, arthritis, and other illnesses is linked to poor mental health. A higher risk of cancer and other chronic illnesses might result from unhealthy lifestyle choices. Young adults have the opportunity to avoid cancer later in life by concentrating on initiatives to identify populations at higher risk for alcohol use, tobacco use, physical inactivity, and other health habits and circumstances that increase risk for cancer.

Although mental health conditions such as stress, sadness, and anxiety can have a substantial effect on a person's health, they are not thought to be a direct cause of cancer. There is a complex relationship between mental health and cancer, according to research, with some findings indicating that stress and mental health issues may indirectly affect cancer risk through changes in lifestyle and other factors.



Figure; 2.1.

2.2.Mechanism how mental health cause cancer

Stress hormones like adrenaline and norepinephrine set off a chain reaction involving neutrophils and dormant cancer cells, the researchers found. Stress hormones in lab dishes induced neutrophils to expel the S100A8/A9 protein pair. These proteins made neutrophils produce certain lipids that, in turn, awakened dormant lung cancer cells. A mixture of norepinephrine and neutrophils also woke up human cancer cells made dormant from chemotherapy.

Surviving cancer cells may be forced into slumber by certain cancer treatments. These inactive cells may develop very slowly or cease to grow altogether. Dr. Perego clarified that because they are so rare, it is hard to detect them with conventional testing. Additionally, unless they begin to develop again, they often don't pose any problems. "We are unsure of the precise cause of their reappearance. "Why at that time?" she asked.

Dr. Perego investigates the role of certain immune cells in the development and metastasis of cancer. Could immune cells awaken dormant cancer cells, she wondered?

Her team either genetically modified lung cancer cells or used a common chemotherapy treatment to treat lung, ovarian, and breast cancer cells to produce dormant cancer cells in the lab. Despite not growing, both types of dormant cancer cells persisted. When latent cells were combined with immune cell types T or B cells in lab plates, they failed to proliferate. However, when combined with so-called "pro-tumor" neutrophils, they began to proliferate once more. White blood cells called neutrophils are a component of the body's first line of defense against infections. However, cancers have the ability to manipulate neutrophils into contributing to the growth and dissemination of the tumor.

Cancer can trigger a wide range of emotions you're not accustomed to handling, just as it can impact your physical health. Additionally, it may intensify already-existing emotions. They could alter every day, every hour, or even every minute. This holds true whether you or a friend or family member is undergoing therapy or has already finished it. All of these emotions are typical. Your upbringing's ideals frequently influence how you

view and manage cancer. For instance some individuals :

• Believe they must be resilient and defend their families and friends.

• Turn to loved ones or other cancer survivors for support.

• Consult a counselor or other expert for assistance.

• Rely on their religion as a coping mechanism.

Some cancer-related anxieties stem from hearsay, rumors, or inaccurate information. Being knowledgeable is frequently helpful in overcoming anxieties and concerns. Most people feel better when they learn the facts. They feel less afraid and know what to expect. Some studies even suggest that people who are well-informed about their illness and treatment are more likely to follow their treatment plans and recover from cancer .

Hearing that you have cancer is frightening. You might be concerned or fearful of:

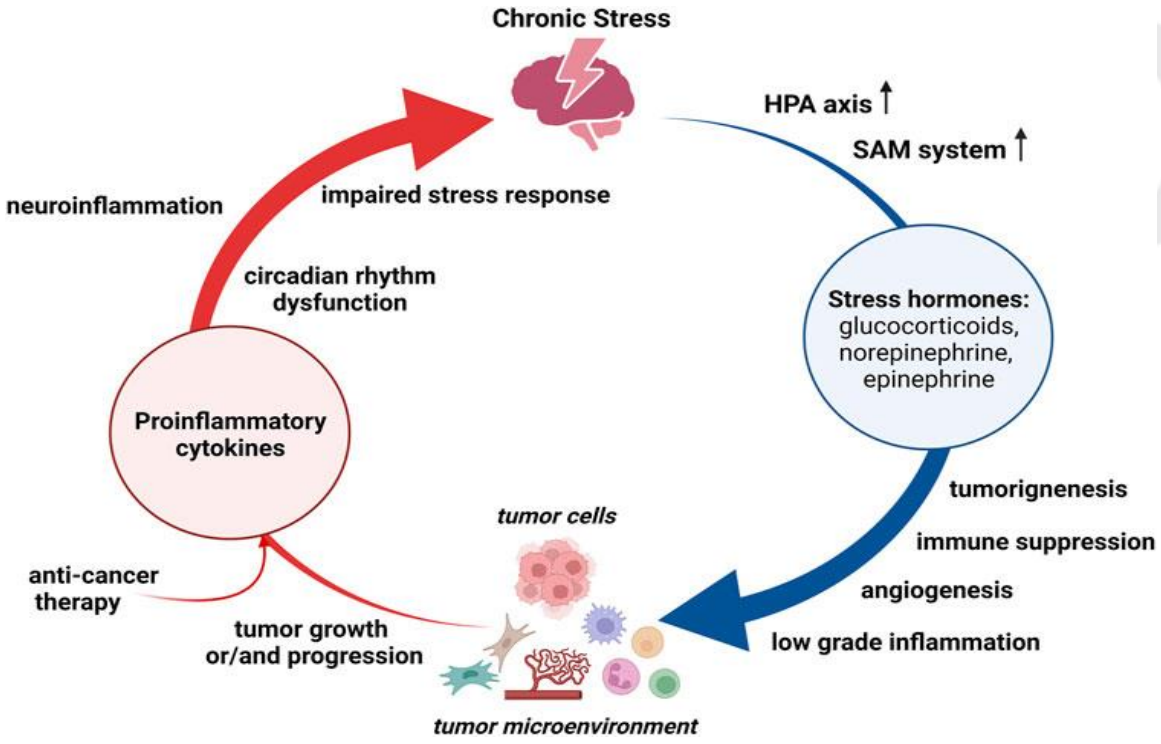
• Feeling ill or changing in appearance as a result of your medical treatments, providing for your family.

• Paying your bills

• Maintaining your employment

• Dying

• Experiencing discomfort as a result of the cancer or the therapy .



Figure;2.2

While the direct link between mental health issue and cancer health development is complex and not fully understood, chronic stress and depression can directly influence cancer progression by affecting the body's immune system, hormones level, and inflammatory responses.

2.2.1.The Neuroendocrine System's Function in Stress: The hypothalamic-pituitary-adrenal (HPA) axis and the sympathetic nervous system (SNS) are both activated by prolonged stress, which results in the release of stress hormones such as catecholamine and cortisol.

2.2.2.Hormonal Effects: These hormones have the ability to affect a number of functions, such as: Tumor Growth and Metastasis: Stress hormones can promote tumor cell proliferation, angiogenesis (blood vessel formation such as arteries, vein and capallaries).

2.2.3.Immune Suppression: Chronic stress can impair the immune system's ability to recognize (identify) the cancer cells and to destroy or fight or against the cancer cells.

2.2.4.Inflammation: Chronic stress can lead to persistent inflammation, which is a known contributor to cancer development. and metastasis (spread of cancer). hormones such as catecholamines and cortisol.

Research indicates that stress hormones can activate neutrophils, which release proteins that arouse dormant cancer cells.

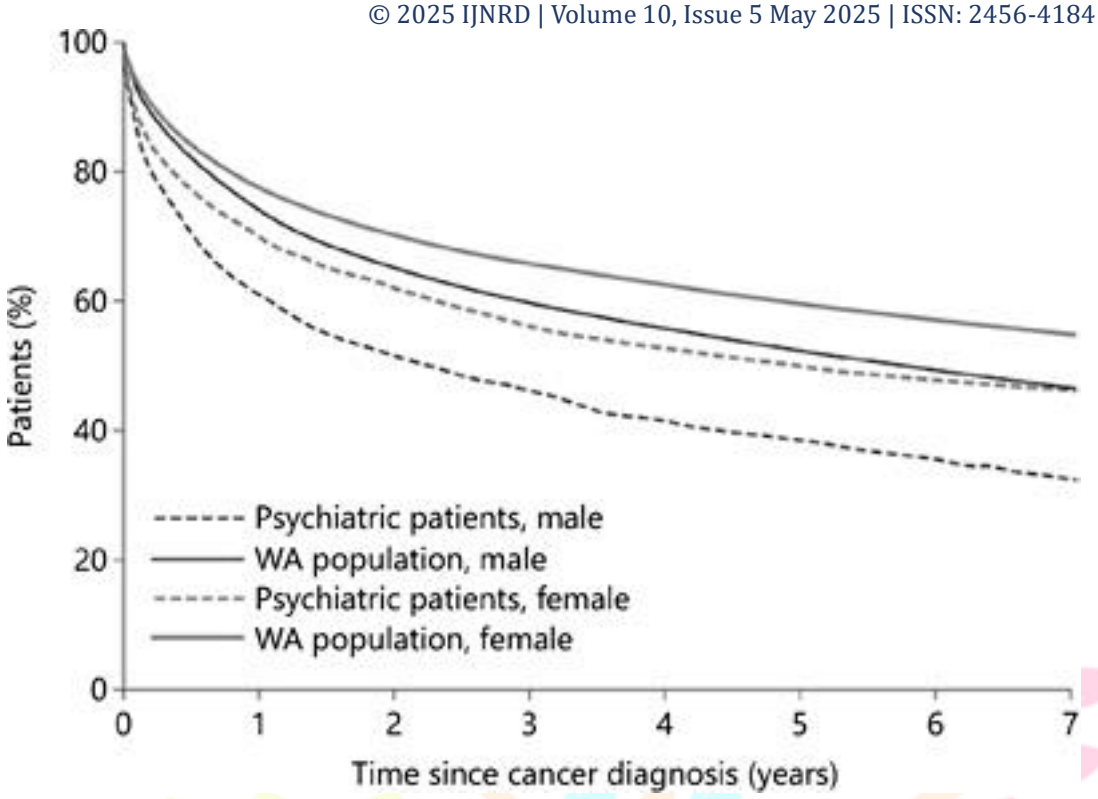
2.2.5.Mental illness and cancer: Depression can result in increased cancer risk, and cancer can worsen depression. Additionally, those with various mental health disorders may have an increased risk of cancer due to factors such as socioeconomic status and risky behaviours.

Young adult mental health issues have been linked to behaviors and potentially changeable factors that raise the risk of cancer. In order to satisfy the needs of young people, efforts to prevent cancer and promote health must address disparities in mental health.

3.1.Overview of excess mortality and mental illness

People with mental illness are known to have lower life expectancy and greater mortality rates than those without mental disease. Since 1985, the difference in life expectancy between those with and without mental illness has grown to 12 years for women and 16 years for men, according to our own research using record linkage systems in Western Australia. This is primarily because improvements in life expectancy for the general population have not been extended to those with mental illness.

Cancer diagnosis rates are comparable between people with and without mental illness; at the same time, however, not only is case fatality after a cancer is diagnosed substantially worse in people with a history of mental illness, but survival times are also much shorter. In order to reduce the excess mortality attributable to cancer, it is important to understand the underlying factors as to why people with mental illness have worse case fatality associated with cancer. There are obvious and immediate avenues to examine, in particular whether lifestyle factors place people with mental illness at greater risk of developing cancer.



Figure;3.1

4.1.Treatment of cancer

Cancer treatment comes in a variety of forms. Some cancer patients receive just one course of treatment. However, the majority of patients receive a mix of therapies, including radiation therapy, chemotherapy, and surgery.

• **Chemotherapy :-** Chemotherapy works by killing or stopping the growth of cancer cells and other fast growing cells. In addition to killing rapidly proliferating cancer cells, chemotherapy also destroys or inhibits the growth of rapidly proliferating and dividing healthy cells

• **Hormone therapy :-** Hormone therapy is a treatment that slows or stops the growth of breast and prostate cancers that uses hormone is grow.

• **Hyperthermia :-** Hyperthermia is a type of treatment in which body tissues is heated to help damage and kill the cancer cells.

• **Immunotherapy :-** Immunotherapy is a type of cancer treatment that help or boost your immune system fight against cancer.

• **Radiation therapy :-** Radiation therapy is a type of cancer treatment that uses high doses of radiation to kill cancer cells and shrink tumors.

• **Blood stem cell transplant :-** People whose blood stem cells have been damaged by the high dosages of chemotherapy or radiation therapy used to treat some types of cancer can have them restored through stem cell transplantation.

• **Cancer surgery :-** When cancer is treated with surgery, the cancer is removed from your body by the surgeon. Medical professionals with specialized training in surgery are known as surgeons.

• **Targeted Therapy :-** One kind of cancer treatment called targeted therapy focuses on the proteins that regulate the growth, division, and metastasis of cancer cells. It serves as precision medicine's cornerstone.

5.1.Discussion

Mental disorders are prevalent, and those who have them bear a disproportionate weight of physical illnesses, such as an increased risk of dying from cancer. According to estimates by Bringmann et al., up to one-third of cancer patients have a history of mental illness. Therefore, managing comorbid mental illness is an important part of cancer treatment. The evidently worse outcomes after a cancer diagnosis underscore the role that prevention and treatment programs are expected to play in reducing these inequities, even if people with mental illness may not be at any higher risk than anybody else for getting cancer. Although none of the research is specifically related to cancer, there is a limited and growing body of information that supports several pathways for bettering physical healthcare for individuals with mental illness. It is possible to lower the incidence rates of many cancer forms because many of the known causes of cancer are preventable. Comparing the overall population is one method of measuring the population impact of adopting key lifestyle characteristics linked to decreased cancer risk.

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REFERENCES

[1]. Pitman A, Suleman S, Hyde N, Hodgkiss A. Depression and anxiety in patients with cancer. BMJ 2018;361:k1415.

[2]. Caruso R, Breitbart W. Mental health care in oncology. Contemporary perspective on the psychosocial burden of cancer and evidence based interventions. Epidemiol Psychiatr Sci 2020;29:e86.

[3]. Walker J, Hansen CH, Martin P et al. Prevalence, associations, and adequacy of treatment of major depression in patients with cancer: A cross-sectional analysis of routinely collected clinical data. Lancet Psychiatry 2014;1:343–50.

[4]. Boland L, Bennett K, Connolly D. Self-management interventions for cancer survivors: a systematic review. Support Care Cancer. 2018;26(5):1585 –95

[5]. Sargent CLIC. Hidden costs: the mental health impact of a cancer diagnosis on young people; 2017.

[6]. Alfano CM, Mayer DK, Bhatia S, Maher J, Scott JM, Nekhlyudov L, Merrill JK, Henderson TO. Implementing personalized pathways for cancer follow-up care in the United States: proceedings from an American Cancer Society –American Society of Clinical Oncology summit. CA Cancer J Clin. 2019;69(3):234 –47.

[7]. Foster C, Calman L, Richardson A, Pimperton H, Nash R. Improving the lives of people living with and beyond cancer: generating the evidence needed to inform policy and practice. J Cancer Policy. 2018;15:92 –5.

[8]. Bray F, Ferlay J, Soerjomataram I, Siegel RL, Torre LA, Jemal A. Global cancer statistics 2018: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2018;68:394–424.

[9]. Freudenheim, J. L., Graham, S., Mar-shall, J. R., Haughey, B. P., Cholewinski,S. & Wilkinson, G. (1991) Int. J. Epide-miol. 20, 368-374.

[10]. Stampfer, M. J. & Willett, W. C. (1993)J. Am. Med. Assoc. 270, 2726-2727.

[11]. Selhub, J., Jacques, P. F., Wilson, P. W.,Rush, D. & Rosenberg, I. H. (1993) J.Am. Med. Assoc. 270, 2693-2698.

[12]. Giovannucci, E., Rimm, E. B., Stampfer,M. J., Colditz, G. A., Ascherio, A., Kear-ney, J. & Willett, W. C. (1994) J. Natl.Cancer Inst. 86, 183-191.

[13]. Giovannucci, E., Colditz, G. A.,Stampfer, M. J., Hunter, D., Rosner,B. A., Willett, W. C. & Speizer, F. E.(1994) J. Natl. Cancer Inst. 86, 192-199.

[14]. Lando J, Williams SM, Williams B, Sturgis S. A logic model for the integration of mental health into chronic disease prevention and health promotion. Prev Chronic Dis. 2006; 3(2):A61. [PubMed: 16539802] .

[15]. National Center for Health Statistics. Health United States 2009: With Special Feature on Medical Technology. Hyattsville, MD: 2010. p. 458-459.

[16]. Schottenfeld, D., Fraumeni, FJ., editors. Cancer Epidemiology and Prevention. 3. New York, NY: Oxford University Press; 2006.

[17]. Moriarty DG, Zack MM, Kobau R. The Centers for Disease Control and Prevention's Healthy Days Measures - population tracking of perceived physical and mental health over time. Health Qual Life Outcomes. 2003.

[18]. Hedden SL. Behavioral health trends in the United States: results from the 2014 National Survey on Drug Use and Health. 2015 .

[19]. Charara R, El Bcheraoui C, Kravitz H, Dhingra SS, Mokdad AH. Mental distress and functional health in the United States. Prev Med. 2016; 89:292–300.
[20]. Clarke, TC., Ward, BW., Freeman, G., Schiller, JS. Early release of selected estimates based on data from the January–March 2015 National Health Interview Survey. U.S. DHHS, CDC, National Center for Health Statistics; Sep. 2015.