Background: Many cancer patients suffer from cancer related fatigue (CRF) both during and after their treatment. CRF can arise at any point in the course of the disease and can be limited or persist, sometimes for years. It gives rise to a vicious circle of impaired physical performance, avoidance of exertion, inactivity, inadequate physical recovery, helplessness, and depressed mood. Its hallmarks are tiredness, exhaustion, and lack of energy. It is associated with increased mortality. Cancer patients are hardly ever systematically asked about the signs and symptoms of CRF. The stress and impairments that it produces are often inadequately appreciated (Berger, Gerber, & Mayer. 2012).

Fatigue affects 70%-100% of people with cancer, especially those receiving treatment for their disease.

Fatigue related to cancer is different from fatigue that healthy people feel. When a healthy person is tired by day-to-day activities, sleep and rest can relieve their fatigue. Cancer-related fatigue is different. Cancer patients get tired after less activity than people who do not have cancer. Also, cancer-related fatigue is not completely relieved by sleep and rest and may last for a long time. Fatigue usually decreases after cancer treatment ends, but patients may still feel some fatigue for months or years (Fatigue (PDQ) National Cancer Institute, 2016). Fatigue has been identified as significantly impacting quality of life in people of all ages who have cancer, regardless of diagnosis, treatment, or prognosis. Patients with fatigue may:

- miss work
- withdraw from friends
- need more sleep, and, in some cases
- may not be able to perform any physical activities

Chemotherapy, radiation therapy, surgery, bone marrow transplantation, biologic and hormonal therapies may all cause fatigue. Fatigue may be experienced when chemotherapy or radiation therapy destroys healthy cells in addition to the targeted cancer cells. Fatigue may occur as the body tries to repair the damage to healthy cells and tissue. Some treatment side effects, such as anemia, nausea, vomiting, pain, insomnia and changes in mood, also may cause fatigue.

The exact mechanism for how cancer treatments cause fatigue is not known.

Several factors have been linked with fatigue caused by chemotherapy. Studies have reported that patients have the most severe fatigue around mid-way through all the cycles of chemotherapy. Fatigue decreases after chemotherapy is finished, but patients often don't feel back to normal even 30 days after the last treatment (Fatigue (PDQ) National Cancer Institute, 2016).
Many patients receiving radiation therapy have fatigue that keeps them from being as active as they want to be. After radiation therapy begins, fatigue usually increases until mid-way through the course of treatments and then stays about the same until treatment ends. For many patients, fatigue improves after radiation therapy stops. However, in some patients, fatigue will last months or years after treatment ends. Some patients never have the same amount of energy they had before treatment (Fatigue (PDQ) National Cancer Institute, 2016).

Biologic therapies often cause flu-like symptoms. These symptoms include being physically and mentally tired, fever, chills, muscle pain, headache, and generally not feeling well. Some patients may also have problems thinking clearly. Severity and type of fatigue symptoms depend on the type of biologic therapy used (Fatigue (PDQ) National Cancer Institute, 2016).

Fatigue is often a side effect of surgery, but patients usually feel better with time. However, fatigue caused by surgery can be worse when the surgery is combined with other cancer treatments (Fatigue (PDQ) National Cancer Institute, 2016).

There are no standardized medical treatments for fatigue. Fatigue is a very important issue in the life of a person with cancer. Understanding fatigue and its causes, in order to determine effective treatment and help people with cancer attain the best possible quality of life, is a priority for the oncology healthcare professional (Berger, Abernethy, Atkinson, Barsevick, Breitbart, Cella, D., ... & Jacobsen, 2010).

Because of the multi causal and multidimensional nature of fatigue, fatigue should be considered a syndrome rather than just a symptom.

Fatigue is subjective. Fatigue can be described as a condition that causes distress and decreased ability to function due to a lack of energy, resulting in Deconditioning. Deconditioning is the whole-body process whereby the body adapts or deteriorates to a lower level of functioning. Cancer survivors rarely choose the word fatigue to describe what they are experiencing but rather use statements that might include:

- “trouble breathing”
- “weak and tired” or
- “can’t get motivated”

In addition, there are no definitive diagnostic indicators for detecting or monitoring fatigue. Therefore, the clinician must accept the individual’s report. The patients’ experience of fatigue is what they say it is and the health care professional must rely on the subjective reports of the patient for assessment and measurement (Ryan, Carroll, Ryan, Mustian, Fiscella, & Morrow, 2007).
Assessing Fatigue:

Screening assessments should include asking patients if they have fatigue (e.g., its presence or absence) and, if present, asking patients to rate fatigue’s intensity by using a simple numeric rating scale (NRS) such as a 0 to 10 intensity scale (e.g., 0 = no fatigue; 10 = worst fatigue you can imagine):

- mild fatigue is indicated by a score of 1 to 3
- moderate fatigue as 4 to 6, and
- severe fatigue as 7 to 10

If patients are unable to rate their fatigue using the 0–10 NRS, as noted occasionally with cancer pain assessment in some patients, the healthcare clinician should ask patients to rate their fatigue by using the words “none, mild, moderate, or severe.” The clinician should document which scale patients prefer, and use this same scale thereafter to screen/reassess patients’ fatigue. For children aged less than 6 to 7 years, the guidelines recommend using the words “tired” or “not tired.” (Piper, Borneman, Sun, Koczywas, Uman, Ferrell, & James, 2008).

The effects of fatigue as a syndrome or phenomenon can be assigned into three categories.

These categories are important because they provide a framework for clinicians in assessing fatigue in people with cancer.

Work Output:

Work output is performance data on overt activity, including occupational, recreational, and activities of everyday living. This category can be defined objectively. Most commonly, estimates of task-oriented work output in people with cancer are obtained through standard clinical functional performance scales, such as the Karnofsky Scale or the assessment of Activities of Daily Living (ADL’s) through a validated measurement scale (Ryan, Carroll, Ryan, Mustian, Fiscella, & Morrow, 2007).

Impairment:

This category includes biophysical changes at the tissue level. Tumor necrosis factor (TNF) is a substance that can be produced by a tumor. TNF may cause a decrease in protein stores in muscles causing the body to work harder to perform normal functions, and therefore causing fatigue. The end point of impairment with respect to work output is metabolic fatigue or exhaustion. Pathological processes contributing to fatigue-related impairment, such as dehydration, and anemia are evaluated through standardized laboratory tests and are amenable to treatment. Definitive biochemical indicators specific to fatigue remain largely unknown (Ryan, Carroll, Ryan, Mustian, Fiscella, & Morrow, 2007).
Fatigue Descriptors:

Patient descriptors of fatigue-related sensations, alterations in mobility, and decreased all-around functioning are critical assessment pieces for the clinician. This category includes subjective sensations and feelings of bodily discomfort and aversion to effort; this includes both the sensory perception and motivation. Some instruments have been developed to investigate perceptions of fatigue for people with cancer.

The Brief Fatigue Inventory (BFI): The one-page BFI has only nine items, with the items measured on 0–10 numeric rating scales. Three items ask patients to rate the severity of their fatigue at its “worst,” “usual,” and “now” during normal waking hours, with 0 being “no fatigue” and 10 being “fatigue as bad as you can imagine.” Six items assess the amount that fatigue has interfered with different aspects of the patient's life during the past 24 hours. Depending on the purposes of measurement, this time interval can be changed to the past week. The interference items include general activity, mood, walking ability, normal work (includes both work outside the home and housework), relations with other people, and enjoyment of life. The interference items are measured on a 0–10 scale, with 0 being “does not interfere” and 10 being “completely interferes.” (Mendoza, Wang, Cleeland, Morrissey, Johnson, Wendt, & Huber, 1999).

Other assessment instruments specific for fatigue are the Cancer Fatigue Scale, the Fatigue Assessment Instrument, and the Multidimensional Fatigue Inventory. Multidimensional scales, such as the general FACT (FACT-G) and the European Organization for Research and Treatment of Cancer (EORTC) Core QOL Assessment Tool, contain a general evaluation of QOL but include specific subscales for fatigue. The two systems both are self-reported (e.g., the patient completes the questions rather than an interviewer) and are similar conceptually (Stasi, Abriani, Beccaglia, Terzoli, & Amadori, 2003).

Fatigue is poorly understood.
There is no definition for fatigue that satisfies all the clinical observations and subjective experiences associated with it. It is known to have both long-term and short-term characteristics. More than any other symptom, fatigue is characterized by multiple and interacting causes. These include biophysical, functional, psychological, social, occupational, disease, treatments and symptom related causes interacting over time. Generally, the pattern of fatigue in relation to disease and treatment is that fatigue becomes progressively worse as treatment continues and/or as the malignancy progresses (Fatigue (PDQ). National Cancer Institute, 2016)

In many cases, fatigue does not end with the conclusion of treatment and improvement in health.
Treating the causes of fatigue
The first step in managing fatigue is to treat any medical causes or conditions that are contributing to fatigue (Cancer.net 2016)

Managing pain. Living with constant pain will almost always make a person feel exhausted. Many of the medicines prescribed for pain also cause drowsiness, sleepiness, and fatigue. The oncology nurse can help the patient understand and access options for managing pain (Cancer.net, 2016).

Managing depression, anxiety, and stress. Dealing with cancer may lead to feelings of distress, depression, and anxiety. These feelings can add to exhaustion and complicate treatment. Managing stress and treating depression and anxiety often make a huge difference in a patient’s level of fatigue (Cancer.net, 2016).

Getting enough sleep. Stress, pain, and worry often interfere with a person's ability to sleep through the night. Some medicines may also disturb normal sleep patterns. For those who are chronically tired, sleep may come in spurts at different times of the day or evening. Not feeling refreshed by sleep or being unable to sleep more than 1 to 2 hours contributes exhaustion. Lack of sleep can also affect your mood and ability to function (Cancer.net, 2016).

Eating healthy. Eating well and drinking enough fluids are important to maintaining an adequate weight and meeting the body's nutritional needs. Referring the patient to a nutrition counselor or registered dietitian (RD) can help with meeting nutritional needs, and provide helpful hints on eating a well-balanced diet (Cancer.net, 2016).

Treating anemia. Many patients with cancer have anemia. Cancer or cancer-related treatments can cause anemia. Patients who have anemia report a feeling of extreme and overwhelming fatigue. The treatment for anemia may include nutritional supplements, drugs, and/or blood transfusions (Cancer.net, 2016).

Co-existing medical conditions. People with cancer may also have other health conditions in addition to cancer, especially if they are older. These conditions can also cause or worsen fatigue, and include:
- Heart problems
- Lowered lung and kidney function
- Hormone problems
- Arthritis
- Nerve problems

Along with treating and managing the medical causes of fatigue, lifestyle changes may help coping with fatigue (Cancer.net, 2016).

Physical Activity. Staying active or becoming more active can help relieve cancer-related fatigue. Increasing activity levels should start slowly. Walking programs are generally safe for most patients and survivors. Many benefit from working with a
physical therapist or exercise specialist. These professionals can find the best ways for patients to increase or maintain physical functioning. This is especially important for those who have a higher risk of injury due to the cancer, its treatment, or other health conditions (Cancer.net, 2016).

**Therapy and counseling.** Talking with a therapist or counselor specially trained to work with cancer patients/survivors can help reduce fatigue. A type of counseling called cognitive behavioral therapy or behavioral therapy may be beneficial. This type of therapy can help patients reframe their thoughts about fatigue. And, it can help improve coping skills and/or sleep problems that contribute to fatigue (Cancer.net, 2016).

**Mind-body strategies.** There is some evidence that the following strategies can reduce fatigue in cancer survivors:

- Mindfulness-based approaches
- Yoga
- Acupuncture

In addition, the following methods may be helpful. However, more research is needed on these strategies.

- Touch therapy
- Massage
- Music therapy
- Relaxation
- A form of touch therapy called reiki
- A type of relaxation/meditation called qigong

Individuals who are interested in mind-body strategies to help manage fatigue should talk with their health care team. They can provide a referral to professionals who specialize in using these methods for cancer survivors (Cancer.net, 2016).

**Conclusion:**

CRF is a common problem for patients during and after cancer treatment that may persist for many years and will worsen as the disease progresses. It is challenging to manage because of its complex and multi-dimensional nature. An individual, empowering and holistic approach is recommended which includes recognition, assessment, and discussion of the symptoms; its probable causes and possible management approaches. Research evidence is still required to provide stronger support and credibility to a wide range of interventions (Kirshbaum, 2010).
MSKCC Foundations in Oncology Nursing

Self Learning Module: The Problem of Fatigue in Cancer

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