



# Selected abstracts submitted to the 2nd International Cancer Fatigue Symposium: Putting the Pieces Together

Hyatt Regency, Montreal, Quebec;  
October 3–4, 2010

## 2<sup>nd</sup> International Cancer Fatigue Symposium

Putting the Pieces Together



The opinions expressed in the abstracts are those of the authors and are not to be construed as the opinion of the publisher (Multimed Inc.), the organizers of the 2nd International Cancer Fatigue Symposium, or the University of Alberta, Faculty of Nursing. Although the publisher (Multimed Inc.) has made every effort to accurately reproduce the abstracts, Multimed Inc. and the organizers of the 2nd International Cancer Fatigue Symposium, or the University of Alberta, Faculty of Nursing, assume no responsibility and/or liability for any errors and/or omissions in any abstract as published.

### FATIGUE ASSESSMENT

P001

#### Cancer-Related Fatigue in Digestive Cancer Patients: An Investigation Based on EORTC QLQ-C30

S.M. Jiang,<sup>\*†</sup> L. Jia,<sup>\*†</sup> Y.Y. Shang,<sup>\*†</sup> Y.J. Li,<sup>‡</sup> D.R. Xie,<sup>§</sup> F.C. Zhi.<sup>||</sup>  
<sup>\*</sup>Guangzhou Medical College, <sup>†</sup>Guangzhou First Municipal People's Hospital, <sup>‡</sup>Sun Yat-Sen University Cancer Center, <sup>§</sup>Second Affiliated Hospital of Zhongshan University, and <sup>||</sup>NanFang Hospital, Guangzhou, Guangdong, PR China.

**Objectives:** In this study, we used the European Organisation for Research and Treatment of Cancer (EORTC) Quality of Life Questionnaire-30 (QLQ-C30) to investigate cancer-related fatigue symptoms in digestive cancer patients.

**Methods:** Between June 2007 and June 2009, the study enrolled 262 inpatients with cancer of digestive system from 4 Guangzhou hospitals: 50 patients with pancreatic cancer (PC), 60 with liver cancer (LC), 50 with esophageal cancer (EC), 50 with gastric cancer (GC), and 52 with colorectal cancer (CC). Fatigue in these patients was evaluated using 3 items from the EORTC QLQ-C30 assessing fatigue symptoms (total possible score: 3–12).

**Results:** Fatigue scores were significantly higher in female patients than in male patients ( $6.34 \pm 2.72$  vs.  $5.56 \pm 2.47$ ,  $p = 0.022$ ). Patients staged III or IV by TNM experienced more severe fatigue than did those staged I or II ( $6.39 \pm 2.70$  vs.  $5.24 \pm 2.34$ ,  $p = 0.001$ ). Fatigue symptoms were more severe in patients who received chemotherapy than in those who underwent surgery ( $6.92 \pm 2.75$  vs.  $5.13 \pm 2.15$ ,  $p = 0.000$ ). In each digestive cancer group, scores by TNM stage and treatment were similarly significantly different, but the differences between male and female patients were nonsignificant. Fatigue scores were sharply higher in the PC group ( $9.74 \pm 2.28$ ) than in the other 4 groups (LC:  $6.03 \pm 1.62$ ; EC:  $4.12 \pm 1.32$ ; GC:  $4.76 \pm 1.30$ ; CC:  $4.44 \pm 1.29$ ; all  $p = 0.000$ ). In addition, scores were higher in the LC group than in the EC group, the GC group, and the CC group (all  $p = 0.000$ ). Differences between the EC group, the GC group, and the CC group were nonsignificant (all  $p > 0.05$ ).

**Conclusions:** Symptoms of fatigue are an obstacle for digestive cancer patients, especially at advanced stages or when being treated with chemotherapy. Pancreatic cancer patients experience more severe fatigue.

P002

#### Liver Cancer-Related Fatigue: Its Correlations with Quality of Life and Social Support of Patients

L. Jia,<sup>\*†</sup> S.M. Jiang,<sup>\*†</sup> Y.H. Liu,<sup>\*†</sup> \*Guangzhou First Municipal People's Hospital and <sup>†</sup>Guangzhou Medical College, Guangzhou, Guangdong, China.

**Objectives:** We investigated cancer-related fatigue symptoms in liver cancer patients and analyzed correlations with quality of life and social support for the patients.

**Methods:** The study enrolled 50 liver cancer inpatients (42 men, 8 women; average age: 47.1 years). The Cancer Fatigue Scale, which consists of 3 scales related to physical, emotional, and cognitive functioning, was used to evaluate fatigue symptoms. The World Health Organization Quality of Life questionnaire, which includes 4 scales (physiology, psychology, social relationships, environment), was used to assess quality of life for the patients. Social support was estimated using the Social Support Revalued Scale (SSRS), which contains 3 scales related to subjective, objective, and utilization of social support.

**Results:** Fatigue symptoms were observed in all of the liver cancer patients. Of the 50 patients, 68% considered that they were at a worse health status, and 52% reported that they were not satisfied with their quality of life (QOL). The analysis showed a significant negative correlation between the total fatigue score and each of the QOL scales (all  $p < 0.05$ ). Similarly, each fatigue scale score was negatively correlated with each QOL scale (all  $p < 0.05$ ), except for cognitive fatigue and environment ( $p > 0.05$ ). In addition, a significant negative correlation was observed between the total fatigue score and the total social support score ( $r = -0.429$ ,  $p < 0.05$ ) and between each fatigue scale and each SSRS scale except for objective support.

**Conclusions:** In liver cancer patients, symptoms of fatigue interact with QOL and social support. Thus, powerful psychological and mental supports from society may help to ameliorate fatigue symptoms. As well, treatments focused on fatigue may be effective in improving QOL for cancer patients.

## FATIGUE ASSESSMENT

P004

**Multifactorial Assessment of Cancer-Related Fatigue in Cancer Patients—Validation of the Polish Version of MFI-20**

T. Buss, A. Kruk, M. Majkiewicz, J. Janiszewska, A. Modlińska,  
M. Osowicka, M. Lichodziejewska-Niemierko,  
Medical University of Gdańsk, Gdańsk, Poland.

**Introduction:** Cancer-related fatigue (CRF) is one of the most frequent symptoms among cancer patients at every stage of the disease. Its causation is multifactorial and multidimensional. A detailed assessment of CRF is necessary to evaluate (for example) the effects of various therapeutic efforts.

There are many tools in English for assessing fatigue. The Multidimensional Fatigue Inventory (MFI-20), developed by E. Smets, is one of the most comprehensive and concise tools, with good psychometric properties. It covers general fatigue (GF), physical fatigue (PF), mental fatigue (MF), reduced motivation (RM), and reduced activity (RA).

**Objectives:** This study aimed to validate the Polish version of the MFI-20 in cancer patients at every stage of the disease.

**Methods:** After obtaining consent of the author of the MFI-20, the English version was translated into Polish (and conversely). To reduce language discrepancy, 2 independent translators produced the translated text. The study recruited 220 cancer patients from hospice ( $n = 40$ ), oncology outpatient clinics ( $n = 50$ ), and hospital wards ( $n = 130$ ). Internal consistency and reliability were assessed using the Cronbach alpha. Concurrent validity was evaluated by calculating the Pearson correlation coefficient between the Eastern Cooperative Oncology Group performance index, a fatigue visual analog scale (VAS), the Cantril Ladder, questions concerning fatigue from the 30-question Quality of Life Questionnaire (QLQ-C30), and the Polish version of the MFI-20.

**Results:** The Polish translation of the MFI-20 was adequate. No important translational discrepancies were observed. The Polish patients showed no serious problems in understanding the translated questions of the MFI-20. The Polish translation of the instrument was found to have good internal consistency (total Cronbach alpha coefficient for the subscales GF, PF, MF, RM, RA were 0.755, 0.795, 0.633, 0.625, and 0.759 respectively). Correlations between the previously listed instruments and all MFI-20 subscales were significant. The highest Pearson coefficient values were observed between the GF and the fatigue VAS and questions concerning fatigue from the QLQ C-30.

**Conclusions:** The Polish version of the MFI-20 is a reliable and valid self-rating scale in terms of its psychometric properties, and it is suitable for cancer-related fatigue assessment.

## DEFINITION OF FATIGUE

P010

**Final Results of the Patient-Reported Outcomes of Fatigue in Cancer Consortium Study: Patients Define Cancer-Related Fatigue**

K. Lasch,\* J. Scott,<sup>†</sup> C. Leonard,\* A. Zeytoonjian,\* A. Yaworsky.\*  
\*Mapi Values US, Boston, Massachusetts, U.S.A., and  
<sup>†</sup>Mapi Values UK, Bollington, Cheshire, U.K.

**Objectives:** Cancer-related fatigue (CRF) is one of the experiences most commonly reported by patients diagnosed with cancer and a universally reported adverse event of cancer treatment, described by cancer patients as more distressing and debilitating than pain, nausea, and vomiting. Its prevalence being documented across all demographic subgroups, in patients with all cancer types, and in every stage of the disease, CRF remains a widely underreported and undertreated health problem. The present study was designed to describe, from the patient perspective, the experience of CRF attributable to the cancer itself or to treatment (or both), and to develop a conceptual framework to underpin measurement of CRF to assess treatment benefit.

**Methods:** Between January 2009 and June 2010, trained interviewers purposively sampled and interviewed 120 cancer patients with a clinician-confirmed diagnosis of CRF. Verbatim transcripts were coded by a research team using qualitative data analysis software. The study used grounded theory methods to capture the patient perspective.

**Results:** The experience of CRF tends to exhibit similarities and differences across cancer types. The core symptoms routinely mentioned by patients were “tiredness” (feeling tired), “lack of energy” (for example, “exhausted” or “worn out”) and “weakness” (for example, lack of strength or stamina). Additional physical, cognitive, and emotional symptoms were mentioned and hypothesized to be linked to cancer type, stage, or treatments. Patients also talked at length about the problems they experienced because of their tiredness, weakness, and lack of energy. Physical, sleep, cognitive, emotional, and social problems or limitations were described. Differentiating physical and cognitive symptoms from functional impairments attributable to fatigue was often difficult, because patients used the effect on life to calibrate the symptoms.

**Conclusions:** Cancer-related fatigue is a multidimensional construct that requires a measurement approach that captures its several dimensions.

P011

**Cancer-Related Fatigue in Children: An Evolutionary Concept Analysis**

I. Cabot,\*<sup>†</sup> M. Duval,\*<sup>†</sup> J. Lacroix,\*<sup>†</sup> N. Humbert,\*<sup>†</sup>  
F. Carnevale,<sup>‡§</sup> \*Centre d'Excellence en Soins Palliatifs,  
CHU Sainte-Justine; <sup>†</sup>Université de Montréal; <sup>‡</sup>Montreal Children's  
Hospital; and <sup>§</sup>McGill University, Montreal, QC.

Pediatric cancer, and particularly symptom management, has received more attention in the past few years. The adult literature contains a dynamic body of research on symptom management, but the pediatric literature is just developing a body of knowledge on symptom management related to cancer and, particularly, fatigue. A few authors have been trying to define cancer-related fatigue (CRF) in children. Recently, some have conducted studies with children experiencing CRF. At this point, few studies have analyzed the concept of CRF. A concept analysis will allow the concept of CRF to be clarified and refined, contributing to further theoretical development.

**Objectives:** We aimed to identify the evolution of the concept of CRF in children and to clarify its use through a rigorous concept analysis.

**Methods:** A comprehensive literature search of several databases (MEDLINE, CINAHL, ALL EBM, PsychInfo) for scientific studies published from 1990 to 2010, using specific keywords, identified only 152 articles, 2 doctoral theses, and 1 book chapter. These items were analyzed using Rodgers evolutionary concept analysis. Relevant literature from each discipline (nursing, medicine, psychology) was stratified as a separated sample. All relevant data were analyzed using an inductive methodology on a contextual basis, including interdisciplinary, sociocultural, and temporal variations.

**Results:** The body of literature in CRF is largely dominated by nursing scholars. The evolutionary view of Rodgers concept analysis allowed us to identify 3 surrogate terms, 7 attributes, 4 antecedents, and 8 consequences. In this analysis, CRF is seen to be a multidimensional and multifactorial subjective experience that has physical, emotional, mental, and spiritual aspects.

**Conclusions:** This analysis is a starting point for CRF concept clarification in pediatric cancer, providing direction for future inquiry. As development and clarification of the concept of CRF continues, researchers will be able to create new measures and interventions for children experiencing CRF.

DEFINITION OF FATIGUE

P012

**An Ethnoscience Approach to Develop a Cross-Cultural Understanding of Fatigue**

M. Kirshbaum,\* K. Olson,† G. Graffigna,‡ K. Pongthavornkamol.§  
 \*University of Huddersfield, Huddersfield, West Yorkshire, U.K.;  
 †University of Alberta, Edmonton, AB; ‡Catholic University of Milan,  
 Milan, Italy; and §Mahidol University, Bangkok, Thailand.

**Background:** Fatigue attributable to cancer and its treatment is a cause of distress around the world, but comparisons of fatigue among people from various countries are limited. Understanding the influence of sociocultural contexts on fatigue could help health care professionals to communicate more clearly with patients and could potentially aid in the development of any required modifications to fatigue interventions.

**Objectives:** In this study, we compared descriptions of fatigue provided by individuals with advanced cancer living in Canada, Thailand, England, and Italy, and we used them to refine the conceptual definition of fatigue as outlined in the Edmonton Fatigue Framework.

**Methods:** A qualitative approach based on ethnoscience is being used to compare the way participants from each study population use language to describe fatigue. Data are being collected using two semi-structured interviews incorporating a card-sort technique, and the results are being used to construct taxonomies showing the dimension of fatigue in each population. The taxonomies will be compared to show similarities and differences between study populations. Data collection in Canada ( $n = 27$ ), Thailand ( $n = 10$ ), and England ( $n = 9$ ) is complete, but it is still underway in Italy.

**Results:** Preliminary analysis shows that while “body” and “mind” are both central to the nature of fatigue in all 4 study populations, the dimensions within these 2 central domains vary. For example, “cognitive function” was central to “mind” in the Canadian dataset, but “blurred consciousness,” a more spiritually-oriented concept, was central to “mind” in the Thai data set.

**Conclusions:** Our team has developed strategies using ethnoscience to advance an understanding of cancer-related fatigue and thereby to contribute to the development of a globally relevant conceptual framework for fatigue management. It is envisioned that the study will stimulate discussion about the ways in which culture shapes the meaning of illness and will therefore influence movement toward culturally sensitive interventions.

FATIGUE INTERVENTIONS

P021

**The Impact of an 8-Week Outpatient Cancer Nutrition Rehabilitation Program on Fatigue**

J. Lemoignan,\* B. Gagnon,\*† \*McGill University Health Centre  
 and †McGill University, Montreal, QC.

**Objectives:** Fatigue is the symptom most frequently reported by patients with cancer. In 2006, a Cancer Nutrition and Rehabilitation Program (CNRP) was developed at the McGill University Health Centre to address the needs of patients with cancer at all stages of the disease. One of the goals of the CNRP is to decrease the level of fatigue experienced by the participating patients. The objective of the present study was to evaluate whether the CNRP could reduce the fatigue experienced by patients with cancer.

**Methods:** From September 2008 to April 2010, 69 patients participated in the CNRP. They underwent evaluation leading to a personalized rehabilitation plan from an interdisciplinary team. The interventions focused primarily on symptom control, nutrition, general function, and quality of life. The Multidimensional Fatigue Inventory (MFI) was used to assess all patients before and after the 8-week outpatient CNRP. The MFI is a validated and reliable 20-item self-report questionnaire designed to measure 5 dimensions of fatigue, each dimension yielding a score out of 20.

**Results:** After patients participated in the CNRP, we observed a clinically and statistically significant decrease in fatigue levels in all dimensions of the MFI: general fatigue (3/20,  $p < 0.001$ ), physical fatigue (↓ 4/20,  $p < 0.001$ ), decreased activity (↓ 4/20,  $p < 0.001$ ), decreased motivation (↓ 2/20,  $p < 0.001$ ), and mental fatigue (↓ 2/20,  $p < 0.009$ ).

**Conclusions:** Participation of patients with cancer in an 8-week CNRP results in a clinically and statistically significant decrease in fatigue in all dimensions measured by the MFI.

P022

**Planning a Fatigue Clinic for Colorectal Cancer Patients**

K. Moore, K. Olson, G. Cummings, D. Aluwihar-Samaranayake.  
 University of Alberta, Edmonton, AB.

Fatigue is recognized as one of the most common and distressing symptoms associated with cancer. Although various approaches to managing fatigue have been used with some success, most have focused on a single dimension of the problem. We are developing a multidimensional intervention that is theoretically grounded in the National Comprehensive Cancer Network Fatigue guidelines and the Edmonton Fatigue Framework. The intervention will take the form of a fatigue clinic that will be pilot tested with a sample of individuals who have been newly diagnosed with colorectal cancer, but who have not yet started treatment. Participants will be followed for 1 year post surgery to determine whether the intervention is helpful in reducing fatigue, dose delays, and dose reductions, and in improving quality of life and ability to return to work. This poster presents a review of the literature on potential barriers to implementing fatigue interventions and lists strategies for building support for fatigue interventions among stakeholders. We also describe how a logic model is being used to plan the intervention, and we provide a tentative description of our minimum dataset and measures.

P023

**Lipid Replacement Therapy: A Nutraceutical Approach to Reducing Cancer-Associated Fatigue and the Adverse Effects of Cancer**

G.L. Nicolson,\* R. Ellithorpe,† R. Settineri,‡ \*Institute for Molecular  
 Medicine, Huntington Beach; †Tustin Longevity Center, Tustin; and  
 ‡Sierra Research, Irvine, CA, U.S.A.

**Objectives:** Cancer-associated fatigue and the chronic adverse effects of cancer therapy can be reduced by lipid replacement therapy (LRT) using a membrane lipid-antioxidant-vitamin mixture given as a food supplement. Recent clinical trials using cancer and non-cancer patients with chronic fatigue have shown the benefits of LRT in reducing fatigue and restoring mitochondrial electron transport function. In addition, LRT reduced the frequency and severity of adverse effects of chemotherapy, resulting in improvements in the incidences of fatigue, nausea, diarrhea, impaired taste, constipation, insomnia, and other quality of life indicators.

**Methods:** Patients ( $n = 67$ ; average age: 57.3 years) diagnosed with various severity levels of chronic fatigue received an oral mixture of membrane glycopospholipids, vitamins, and minerals (NTFactor, Physician’s Advanced Formula, or Revacel: Nutritional Therapeutics, Commack, NY) for 1 week. The Piper Fatigue Scale was used to assess fatigue before, while, and after patients received the supplements.

**Results:** On the Piper Fatigue Scale, fatigue declined by 36.8% ( $p < 0.001$ ) in 1 week. There were no differences between the responses of men and women, and no adverse effects of the supplement occurred during the study.

**Conclusions:** Lipid replacement therapy appears to be a useful, nontoxic method to reduce fatigue in patients with or without cancer.

## FATIGUE INTERVENTIONS

P024

**The Impact of an 8-Week Palliative Rehabilitation Program on "Fatigue Associated Clusters" in Patients with Cancer**

C. Martinho,\*† J. Martin-MacKay,\* C. Cranston,\*  
L. Savage-Larose,\* J. Macintosh,\* D. Gravelle,\*  
R. Bhagarva,\* M. Chasen.\*† \*Brüyère Continuing Care  
and the †Ottawa Regional Cancer Centre, Ottawa, ON.

**Objectives:** Fatigue is associated with other symptom clusters. The components contributing to the development of fatigue can be measured individually. The Élisabeth Brüyère Hospital Palliative Rehabilitation Clinic opened in February 2010. The objective of the clinic's 8-week program is to empower patients to take control of the effects of cancer or its treatments on their own well-being. The program provides an interdisciplinary team assessment and treatment for patients and their families.

**Methods:** To be eligible for the program, the patient must be an adult with a Palliative Performance Scale score of 50% or more, who is experiencing anorexia, weight loss, fatigue, pain, weakness, anxiety, depression, and other symptoms. Patients are assessed before and after the program. Fatigue is measured using the Multidimensional Fatigue Inventory (MFI-20). Other symptoms are measured using the Edmonton Symptom Assessment System, the Distress Thermometer, the General Self Efficacy Scale, Patient-Generated Subjective Global Assessment, the Coping Thermometer, the Modified Canadian Occupational Performance Measure, and the M.D. Anderson Symptom Inventory Core Items. A general psychosocial assessment that includes assessment of depression and anxiety is completed. Signed informed consent is obtained before the start of the program. Care is discussed in a group setting, and individual treatments are planned. The intervention includes an exercise program, education and activity modification, nutritional advice, appropriate symptom management, pertinent medical therapy, psychosocial treatment, and referral to community resources for further aid. As of May 2010, 10 patients were registered.

**Results:** Updated results will be presented in October 2010.

**Conclusions:** Improvements in physical functioning, nutritional intake, and activity level have been observed. In addition, patients have reported improvement in their fatigue level and overall quality of life.

## CAUSATIVE MECHANISMS—PERIPHERAL

P030

**Tumour-Induced Myopathy Occurs in Both Skeletal and Cardiac Muscle of Tumour-Bearing Mice**

D. McCarthy Beckett,\* L.E. Wold.† \*The Ohio State University  
College of Nursing and †The Research Institute of Nationwide  
Children's Hospital, Columbus, OH, U.S.A.

**Objectives:** Fatigue occurs in 70% of cancer patients regardless of tumour type or antitumour therapy, and is thought to be mediated by pro-inflammatory cytokines induced by tumour growth or therapy. In rodents, fatigue is modeled as decreased voluntary wheel-running activity. Work in our laboratory suggests that skeletal muscle wasting is a major factor contributing to fatigue in tumour-bearing mice. However, no studies have determined if wasting also occurs in the myocardium.

**Methods:** Adult female mice were inoculated subcutaneously with Colon26 adenocarcinoma cells and were euthanized 21 days later. The gastrocnemius and heart muscles were removed, weighed, and homogenized in TRizol (Invitrogen Corporation, Carlsbad, CA, U.S.A.) for extraction of total RNA. The cDNA transcripts were subjected to real time polymerase chain reaction using primer sets for interleukin 6 (a pro-inflammatory cytokine implicated in muscle wasting), MAFbx (a rate-limiting enzyme involved in ubiquitin-mediated myosin degradation), and Bnip3 (a protein involved in formation of lysosome-mediated autophagy). Data were normalized to expression of GAPDH. Additional animals underwent echocardiography before euthanasia for single-fibre analysis of contractile function of heart muscle.

**Results:** The gastrocnemius muscle, but not the heart muscle, was smaller in the tumour-bearing mice than in healthy control mice. However, expression of MAFbx, Bnip3, and interleukin 6 mRNA were elevated in both the gastrocnemius and the heart muscle of tumour-bearing mice. Echocardiography demonstrated that fractional shortening, a measure of systolic function, was reduced in the hearts of tumour-bearing mice. These data were confirmed by single-fibre analyses, which showed decreased sarcomere departure velocity and increased time to peak contraction.

**Conclusions:** Depressed contractile function, related to muscle protein degradation in the heart, may contribute to the decrease in voluntary running activity in this mouse model of tumour-induced fatigue. These data suggest that non-overt cardiomyopathy could contribute to fatigue in cancer patients.

## OTHER

P040

**Logic Never Tires: Use of a Logic Model for the Development of a Cancer-Related Fatigue Clinic at Princess Margaret Hospital**

S. Phan, L. Durkee, A. Chafrańska, P. Catton, J. Nyhof-Young,  
Princess Margaret Hospital, Toronto, ON.

**Objectives:** To describe how the Kellogg logic model (LM) was used in the development, implementation, and evaluation of a cancer-related fatigue (CRF) clinic at Princess Margaret Hospital.

**Background:** Cancer-related fatigue is a largely unrecognized and poorly managed problem of cancer patients and survivors that causes distress and interferes with daily activities. The frequency and severity of CRF in breast cancer (BC) patients, during and after treatment, indicates the need for clinical interventions to improve physical functioning, emotional and psychological health, and quality of life. The CRF clinic empowers BC patients with persistent post-cancer-treatment fatigue by teaching self-management skills to cope more effectively with their fatigue.

**Methods/Results:** In helping to build the clinic, trans-disciplinary clinical staff collaborated to complete the LM framework. Since April 2007, 65 patients have been seen, and 81 follow-up visits have occurred. The traditional LM planning sequence was initially inverted to increase the creative focus on, and brainstorming about, outcomes such as enhanced self-management skills, quality of life, and patient and staff CRF awareness. The situation statement was written to communicate the relevance of the CRF clinic. The inputs described the clinic resources, including human resources, the program knowledge base, and collaborator involvement. Continuously refining the outputs forced linkages to be established between the situation and the intended outcomes, as captured through session and group attendances, research, and program activities. Programmatic research showed that patients who attended the clinic learned new information, changed their behaviours, and felt empowered in fatigue self-management, and that BC-site registered nurses desired enhanced CRF education.

**Conclusions:** The LM was a useful organizing framework for development of key CRF clinic components. It provided staff with a theoretical basis for activities and assumptions, assisted in reaching an understanding of cause-and-effect relationships, and developed accountability structures for outcomes and measurement. It set the stage for developing structures for program evaluation and monitoring.

**Fatigue as a Cause of Sexual Problems in Breast Cancer Patients**

E. Uña Cidón. Clinical University Hospital, Valladolid, Spain.

**Background and Purpose:** Unfortunately, breast cancer (BC) is a common and dreaded experience. Surgical treatment may be stressful, and adjuvant treatment may considerably affect quality of life (QOL), causing intense fatigue in these patients. Chemotherapy may cause early menopause, which also may have an impact on a woman's life, increasing fatigue and making daily life difficult. This study examined the impact of fatigue on the sexual life of patients who spontaneously spoke to medical oncologists.

**Methods:** We recruited women who spontaneously spoke us about their sexual life as a problem affecting their lives. We collected sociodemographic characteristics, marital status, satisfaction with sexual life, symptoms, the methods used to communicate these symptoms, types of surgical treatment, timing of communication, and pre-diagnosis of sexual problems.

**Results:** In 122 sexually active women (46% of all BC patients), sexual problems were experienced at baseline without pre-diagnosis. Of these women, 68% were in a stable relationship, 100% were Caucasian, and all were younger than 68 years of age. Most participants were premenopausal. Sexual problems were greater immediately after surgical treatment (mainly after mastectomy as compared with conservative surgery,  $p < 0.01$ ) and also within 6 months after chemotherapy. Although these patients complained about multiple symptoms such as vaginal dryness, itching, or discharge, or painful sexual relations, most complained about a lower perceived need for sex because they felt tired. This symptom gradually increased during chemotherapy. After finishing chemotherapy, symptoms began to decrease over time. Symptoms were still relevant 8 months after surgical treatment. Most of these women discussed the sexual problems with the doctor because they were worried about the effect on their relationship with their partner.

**Conclusions:** Surgical treatment and chemotherapy caused fatigue and, secondarily, loss of sexual interest. Our findings show the high incidence of this symptom and encourage us to give women the opportunity to ask questions and receive early interventions. Psychological support could help these women to improve their sexual interest and therefore contribute to improving their QOL.

P041

## OTHER

P042

### Factors Associated with the Severity of Cancer Related Fatigue in Patients with Advanced Cancer Presenting to a Supportive Care Clinic

S. Yennurajalingam, D. Urbauer, E. Bruera. *The University of Texas M.D. Anderson Cancer Center, Houston, TX, U.S.A.*

**Background:** Despite the high prevalence of fatigue, little research has been done on factors associated with fatigue in advanced cancer patients presenting to an outpatient supportive care centre. The aim of the present study was to determine the association between fatigue measured by the Edmonton Symptom Assessment System (ESAS) and various clinical factors in patients with advanced cancer presenting for the initial visit to a supportive care centre in a comprehensive cancer centre.

**Methods:** We reviewed the charts of 1777 consecutive patients between January 2003 and December 2008. We analyzed correlation coefficients to determine the association between fatigue and other symptoms in the ESAS (including the sleep question) at the initial visit. We used a Kruskal–Wallis test to determine associations with sex, race, cancer site, baseline anemia, low albumin, and alcoholism.

**Results:** The patients (52% men) had a median age of 59 years. The most common cancer types were head-and-neck and lung cancer (27%). Mean fatigue score was 6 ± 2.39, with 80% having moderate or severe fatigue ( $n = 1489$ ). We found no univariate associations for fatigue with age ( $p = 0.06$ ), sex ( $p = 0.07$ ), race ( $p = 0.11$ ), type of cancer ( $p = 0.32$ ), anemia ( $p = 0.1$ ), or alcoholism (CAGE+). We observed correlations for fatigue with pain ( $r = 0.23$ ,  $p < 0.0001$ ), nausea ( $r = 0.31$ ,  $p < 0.0001$ ), anxiety ( $r = 0.33$ ,  $p < 0.0001$ ), depression ( $r = 0.33$ ,  $p < 0.0001$ ), drowsiness ( $r = -0.24$ ,  $p = 0.0002$ ), dyspnea ( $r = -0.17$ ,  $p = 0.007$ ), anorexia ( $r = 0.41$ ,  $p < 0.0001$ ), insomnia ( $r = 0.25$ ,  $p < 0.0001$ ), dyspnea ( $r = 0.33$ ,  $p < 0.0001$ ), and well-being ( $r = 0.36$ ,  $p < 0.0001$ ). Using a linear regression model, independent predictive factors associated with fatigue included pain ( $p < 0.0001$ ), nausea ( $p < 0.0001$ ), depression ( $p < 0.0001$ ), anorexia ( $p < 0.0001$ ), drowsiness ( $p < 0.0001$ ), dyspnea ( $p < 0.0001$ ), and low albumin ( $p < 0.0001$ ). The final predictive model's  $R^2$  was 0.33.

**Conclusions:** Pain, nausea, depression, anorexia, drowsiness, dyspnea, and low albumin are predictive of fatigue in patients presenting to an outpatient supportive care clinic. These findings support the need for multidimensional assessment and management of fatigue in patients with advanced cancer. Further studies are required to identify the predictive factors for intensity of fatigue in this setting.

P044

### Prevalence and Predictors of Fatigue in a Large Population Based Ambulatory Cancer Cohort at Various Stages of Cancer

D. Howell,\* L. Barbera,<sup>†</sup> H. Seow,<sup>‡</sup> D. Dudgeon,<sup>§</sup> C. Earle,<sup>||</sup> A. Husain,<sup>#</sup> J. Sussman,<sup>‡</sup> R. Stradjahur,<sup>†</sup> C. Atzema.\*\*

\*Princess Margaret Hospital, Toronto; <sup>†</sup>Institute for Clinical Evaluative Sciences, Toronto; <sup>‡</sup>McMaster University, Hamilton; <sup>§</sup>Queens University, Kingston; <sup>||</sup>Ontario Cancer Research Institute, Toronto; <sup>#</sup>Temmy Latner Palliative Care Program, Toronto; and \*\*Sunnybrook Health Sciences, Toronto, ON.

Fatigue is the most prominent and disabling symptom across cancer populations and is often unrecognized in clinical care. Since 2007, the Edmonton Symptom Assessment System (ESAS) and the Palliative Performance Scale (PPS) have been routinely collected in cancer patients across hospital and home settings as part of province-wide distress screening in Ontario.

**Purpose:** We aimed to describe the prevalence and predictors of fatigue (measured as ESAS tiredness) in a cross-section of the population in the distress-screening database.

**Methods:** This descriptive study used linked administrative health care data from between 2007 and 2009 to capture ESAS and PPS scores for cancer patients across Ontario. The cohort included all patients at the time of their first screening with ESAS and PPS. The univariate and multivariate odds for fatigue as predicted by covariates of age, income, comorbidity, income, and cancer type were calculated.

**Results:** The cohort included 45,318 unique ESAS screens for a population with a median age of 66 years and slightly more women than men. Most screens were collected in ambulatory cancer clinics. Fatigue was reported in more than 75% of the cohort with the lowest median fatigue score (2 points) noted in genitourinary cancer and the highest (5 points) in central nervous system cancer. In multivariate analysis, patients 80 years or older with central nervous system cancer and a greater number of comorbid conditions had higher odds of severe fatigue (ESAS score: 7–10). Patients who survived less than 90 days had 4 times the severe fatigue of the other patients.

**Conclusions:** This study is one of the first to describe the prevalence and predictors of fatigue as measured by ESAS tiredness in an unprecedented population cohort of cancer patients. Most patients reported fatigue, and those in older age groups may be most at risk for severe fatigue.

P045

### Fatigue, Physical Activity, Physical Functioning, and Quality of Life in Older Women with Breast Cancer

M. Lucitar-Flude, J. Tranmer, D. Groll. *Queen's University, Kingston, ON.*

**Objectives:** Breast cancer is a disease that predominantly affects older women. Cancer fatigue is the most common and often the most distressing symptom associated with cancer and its treatment. Fatigue may lead to significant reductions in physical activity, physical functioning, and health-related quality of life (HRQOL). However, few studies have explored cancer fatigue in older women with breast cancer. The purpose of this longitudinal descriptive study was to describe levels of and relationships between fatigue, physical activity, physical functioning, and quality of life in older women with breast cancer.

**Methods:** A cohort of women aged 65 years and older were recruited after their initial consultation for cancer treatment at 1 cancer centre in Ontario. At baseline, the study enrolled 110 participants (mean age: 72.8 ± 5.5 years). Subjects completed self-report surveys at baseline and at 3-month intervals for a period of 12 months. Outcome measures were assessed using the Memorial Symptom Assessment Scale, the Physical Activity Scale for the Elderly, the “physical” component score of the Medical Outcome Short Form 12 General Health Questionnaire, and the European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30).

**Results:** Fatigue was the most prevalent symptom reported at baseline (75.5%), at 3 months (79.1%), at 6 months (79.1%), at 9 months (79.1%), and at 12 months (80.0%).

Fatigue scores declined slightly after treatment; however, higher fatigue scores were associated with lower physical activity, physical function, and quality-of-life scores. Lower levels of physical activity were associated with lower levels of physical functioning and quality of life.

**Conclusions:** Findings from this research suggest that addressing cancer fatigue and promoting physical activity in older breast cancer survivors may contribute to maintenance of physical function and HRQOL in this population.

P046

### Depression and Cancer-Related Fatigue:

#### A Cross-Lagged Panel Analysis of Causal Effects

L.F. Brown,\* K. Kroenke,<sup>†‡§</sup> K.L. Rand,\* S.M. Bigatti,<sup>||</sup>

\*Indiana University Purdue University–Indianapolis; <sup>†</sup>Indiana University; <sup>‡</sup>Regenstrief Institute; <sup>§</sup>Richard Roudebush VA Medical Center; and <sup>||</sup>Indiana University School of Medicine, Indianapolis, IN, U.S.A.

**Objectives:** Fatigue is one of the most common and debilitating symptoms reported by cancer patients, and yet it is infrequently diagnosed or treated and relatively little is understood about its causation in the cancer context. Recently, as researchers have begun to focus attention on cancer-related fatigue (CRF), depression has emerged as its strongest correlate. Few longitudinal studies have been done to determine whether causal influences between the two symptoms exist, however. The aim of the present study was to determine whether depression has a causal influence on CRF over time and whether reciprocal effects exist.

**Methods:** The study used a single-group cohort design of longitudinal data from a randomized controlled trial of an intervention for pain and depression in a heterogeneous sample of cancer patients ( $n = 405$ ). To be eligible, participants had to meet criteria for clinically significant pain or depression. A hypothesis that depression would influence a change in fatigue after 3 months was tested using latent-variable cross-lagged panel analysis, a structural equation-modelling technique. A second hypothesis was that fatigue would also influence change in depression, but at a lesser magnitude.

**Results:** Depression and fatigue were strongly correlated in the sample (baseline correlation of latent variables was 0.72). Although the model showed good fit to the data,  $\chi^2(66, n = 329) = 88.16$ ,  $p = 0.04$ , SRMR = 0.030, RMSEA = 0.032, and CFI = 1, neither cross-lagged structural path was significant.

**Conclusions:** The findings suggest that depression had no causal influence on changes in fatigue in this sample, and fatigue did not influence change in depression. The clinical implication is that depression treatment may not be helpful as a treatment for CRF, and therefore interventions specifically targeting fatigue may be needed. Future research should include additional waves of data and larger sample sizes.

## OTHER

P047

**Clinical Factors Associated with Fatigue in Colorectal, Breast, and Prostate Cancer Patients: A Cross-Sectional Study**

C. Pimenta,\* D. Mota,† P. Braga,\* G. Kurita,\* R. Caponero.‡

\*University of Sao Paulo, Sao Paulo; †Goias Federal University, Goias; and ‡Medical Oncology Clinic, Sao Paulo, Brazil.

**Objectives:** We set out to describe the prevalence, intensity, and associated factors of fatigue in breast, colorectal, and prostate cancer patients.

**Methods:** Our cross-sectional study looked at a convenience sample of 404 outpatients from 4 Brazilian oncology clinics (mean age: 58 ± 12 years; 44% with breast cancer, 39% with colorectal cancer, and 17% with prostate cancer; 56% with tumour staging III or IV; 60% in cancer treatment). Patients were scored using the Identification Profile, Piper Fatigue Scale-Revised (0–10), the Beck Depression Inventory (0–63), Karnofsky performance status (0–100), and pain and sleep disturbance (0–10) numeric scales. Logistic regression analyses were performed, and the probability of fatigue occurring was calculated considering the presence of associated factors.

**Results:** The prevalence of clinically significant fatigue (>4) was 33%, 27%, and 39% for the breast, colorectal, and prostate cancer patients respectively ( $p = 0.183$ ). The median scores for fatigue were 5.4 (colorectal), 6.0 (breast), and 5.8 (prostate,  $p = 0.297$ ). Independent factors associated with fatigue were (in breast cancer patients) performance status, sleep disturbance, and pain (probability of fatigue occurrence was 49%); (in colorectal cancer patients) performance status, sleep disturbance, and depression (probability of fatigue occurrence was 79%); and (in prostate cancer patients) performance status and pain (the probability of fatigue occurrence was 46%). The groups differed in some sociodemographic variables, but did not differ in the prevalences of sleep disturbance, depression, pain, and performance status. The depression syndrome includes sleep impairment and fatigability, which may explain the association between depression and fatigue.

**Conclusions:** Fatigue prevalence and intensity and associated factors were similar in the three groups. Performance status was an independent risk factor in 3 groups (colorectal, breast, and prostate cancer), pain in 2 groups (breast and prostate), and sleep disturbance also in 2 groups (colorectal and breast). Despite similar factors, the influence of those factors on the probability of fatigue occurrence varied between the various cancer diagnoses.

P048

**Brazilian Contribution on Cancer-Related Fatigue**

D. Mota,\* G. Kurita,†‡ C. Pimenta.† \*Goias Federal University, Goias, and †University of Sao Paulo, Sao Paulo, Brazil; and ‡Rigshospitalet, Copenhagen, Denmark.

**Objectives:** We aimed to identify cancer fatigue studies developed in Brazil and to analyze their contribution to knowledge about cancer fatigue.

**Methods:** In a systematic review, we looked at published articles that aimed to measure or diagnose, characterize, manage, and identify factors associated with fatigue in Brazilian adult cancer patients. A literature search of PubMed, MEDLINE, and LILACS was conducted using the MESH terms “fatigue” and “neoplasms.” Brazil was an affiliation limiter. The search covered the entire database to May 2010.

**Results:** Sixty abstracts were found, and eight were selected (one qualitative, two prevalence, two instrument validation, and three interventional studies). Seven studies were published after 2005. The qualitative study (perception of fatigue among leukemia patients) and one prevalence study (fatigue symptoms among laryngeal cancer patients) revealed a high prevalence of fatigue symptoms, a negative impact of fatigue, the need to adapt one’s lifestyle, and management strategies. Another prevalence study (colorectal cancer patients) showed that half the patients experienced fatigue, partially co-occurring with depression, and that all depressed patients experienced fatigue, but only about 1 in 5 fatigued patients was depressed. One interventional study tested a jogging program in breast cancer patients undergoing chemotherapy (quasi-experimental study). Two tested multivitamins compared with placebo, and guaraná (*Paullinia cupana*) compared with placebo, for breast cancer patients starting adjuvant radiotherapy (randomized crossover trials). Only the jogging program showed benefit. The Piper Fatigue Scale-Revised and the Functional Assessment of Cancer Therapy-Fatigue were validated in Portuguese.

**Conclusions:** Publications on fatigue in Brazilian cancer patients are recent. Although there are few studies, the results show that the prevalence and perception of fatigue in Brazilian cancer patients are very similar to those seen in other international studies. The tools used for fatigue measurement can be the same as those used elsewhere. Original contributions are related mainly to factors associated with fatigue and new interventions for fatigue management such as guaraná, demonstrating an effort to better understand and manage the symptom with national products.

P049

**What Are the Relationships Between Symptoms, Dietary Intake, Weight Loss, and Functional Capacity (Fatigue)?**

K. Schmidt,\* K. Olson,\* K. Hunter,\* M. Parliament,\* C. Kubrak,†

S. Ghosh.† \*University of Alberta and †Alberta Health Services, Edmonton, AB.

**Objectives:** We are interested in the relationship between dietary intake and fatigue. The objectives of the present study were to test the validity of the Head and Neck Symptom Checklist (HNSC), a new instrument for assessing 17 symptoms reported in the literature to interfere with dietary intake, and to examine the ability of a subset of those symptoms, plus age, sex, stage, and tumour location to predict reduced dietary intake, involuntary weight loss, and reduced functional capacity (our proxy measure for fatigue).

**Methods:** We retrospectively reviewed and analyzed data collected from an existing database of 377 individuals (110 women, 267 men) who were newly diagnosed with head-and-neck cancer between March 9, 2007, and January 15, 2010, and who lived in northern Alberta. Scores for 12 of the HNSC symptoms were also available on the Patient-Generated Subjective Global Assessment (PG-SGA). We assessed the validity of the HNSC by calculating sensitivity, specificity, and positive and negative predictive value for these 12 symptoms, compared with scores on the PG-SGA. After stage of disease and tumour location were retrieved from patient charts, we examined correlations between study variables and the ability of stage, location, age, sex, and the 12 HNSC symptoms to predict involuntary weight loss, reduced nutritional intake, and functional capacity.

**Results:** Sensitivity ranged from 0.79 to 0.98, specificity ranged from 0.99 to 1.0, positive predictive value ranged from 92% to 100%, and negative predictive value ranged from 94% to 100%. This poster also includes correlations between the study variables and the results of the regression analysis described earlier.

**Conclusions:** The 12 HNSC symptoms examined appear to be valid symptom measures. The ability to identify symptom-related causes of decreased dietary intake before treatment increases the opportunity for early intervention and may improve treatment outcomes, prevent fatigue, and improve quality of life.