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INDIVIDUAL, DISEASE, AND WORK-RELATED FACTORS ASSOCIATED WITH WORK PATTERNS, PRESENTEEISM AND SICK PAY POLICY OF THE COLORECTAL CANCER SURVIVOR AFTER TREATMENT

A Dissertation Presented

by

KRISTIN A. ROPER

Submitted to the Office of Graduate Studies,
University of Massachusetts Boston,
In partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

June 2014

Nursing Health Policy Program

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INDIVIDUAL, DISEASE, AND WORK-RELATED FACTORS

ASSOCIATED WITH WORK PATTERNS, PRESENTEEISM AND SICK PAY

POLICY OF THE COLORECTAL CANCER SURVIVOR AFTER TREATMENT

A Dissertation Presented

by

KRISTIN A. ROPER

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ABSTRACT

INDIVIDUAL, DISEASE, AND WORK-RELATED FACTORS ASSOCIATED WITH WORK PATTERNS, PRESENTEEISM AND SICK PAY POLICY OF THE COLORECTAL CANCER SURVIVOR AFTER TREATMENT

June 2014

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Participation of colorectal cancer survivors (CRC) in the workforce has been described by clinicians, survivors, and researchers as a way to improve mood, quality of life (QOL), and survival. Maintaining self-esteem and financial independence have also been attributed to continued employment of the CRC survivor. The purpose of this cross-sectional survey was to describe patterns of employment of the CRC survivor and to examine the individual, disease, and work-related factors that influence presenteeism and perceived adequacy of sick pay (ASP) policy. The Conceptual Model of Nursing and Health Policy and the Pathways to Work Life Recovery guided the design, selection of variables, and specification of the relationship between variables. The study included 97 CRC survivors who were employed at the time of diagnosis and who had completed treatment ≥ 6 months and < 7 years to survey. Among working subjects, at-work limitations (“presenteeism”) were measured by the Work Limitations Questionnaire

(WLQ) consisting of four scales: Time Management, Physical Tasks, Mental-Interpersonal Tasks, and Output Tasks scales. The EORTC QLQ-C30 V3 was used to measure quality of life and the PHQ-9 for depression. The majority of gaps in employment occurred within the first year of diagnosis (21%) and attributed to poor health (56%), having been fired or laid off due to cancer (11%) or retirement (33%). A total of 27% had gaps in employment by 3 years; 13% were intermittent. The unemployment rate for cancer survivors in this study was 18.6% at the time of survey. Slightly over 25% of those who experienced a gap in employment did so involuntarily. Higher education (OR = 0.346, p=.006) was the only variable that significantly associated with a gap in employment. Having insurance (p=.03), QOL (p=.01), and depression (p=.003) significantly contributed to increased presenteeism. Earlier stage (OR=0.330, p=.050) and professional occupation (OR=3.281, p=.040) significantly contributed to perceptions of having an ASP policy. The importance of measuring continued employment of CRC survivors is supported in this study. The provision of an ASP policy may avoid disruption of work and create an easier transition for continued employment of the CRC survivor.

DEDICATION

I dedicate this dissertation to the most important people in my life who have influenced my passion in research. My mother has been the greatest force who challenged me to discover and learn and to overcome adversity. And thank you to Michael, my husband, best friend, and love of my life, and my children, Jacqueline and Christopher, for encouragement and support in my pursuit of discovery throughout this process.

ACKNOWLEDGEMENTS

First, I would like to acknowledge the many patients I have encountered who have inspired me to pursue research aimed to improve the lives of those who are diagnosed with cancer. In particular, I have had many discussions with patients about the importance of their “work” and concerns about “calling in sick” and jeopardizing their job and consequently their treatment.

I would like to acknowledge my committee and in particular, Dr. Jacqueline Fawcett, my chairperson. I am inspired by her intellect, intuitiveness, and love of nursing that has had a positive influence on my career.

I would also like to acknowledge Dr. Mary Cooley who took me under her wing and invested her time and expertise to mentor me. Dr. Cooley provided me the “opportunity of my life” to work with a consummate researcher and a genuine individual to whom I will be forever grateful.

I wish to express my gratitude to Dr. Debra Lerner who provided guidance to better understand the impact of chronic health problems on job performance and productivity.

I am grateful to Dr. Susan Parsons who provided insight about the assessment of chronic illness and its’ impact on quality of life.

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CHAPTER ONE

INTRODUCTION

It is estimated that there were 143,460 new colorectal cancer survivors in the United States in the year 2012 (National Cancer Institute, 2012) . The American Cancer Society (ACS) guidelines for the screening and surveillance of colorectal cancer to begin at age 50 for average risk adults is intended to increase early detection of adenomatous polyps and colorectal cancer (R. A. Smith, Cokkinides, & Brawley, 2009). The treatment for localized-stage colorectal cancer is usually surgical resection, whereas regional and distant stage colorectal cancer most often involves surgery with radiation and/or chemotherapy (American Cancer Society, 2008). The five-year survival rate is 90 percent for localized-stage; 68 percent, for regional stage; and 11 percent, for distant stage colorectal cancer. As more people are diagnosed at earlier stages, survival rates for colorectal cancer patients are expected to improve (Mariotto, Yabroff, Feuer, DeAngelis, & Brown, 2006; University of Connecticut, 2008). Even though colorectal cancer survivors represent only 11 percent of over 11 million cancer survivors, life expectancy has created a new paradigm of the survivorship care that continues well beyond the expectations of prior generations (Gilbert et al., 2008; Hassey-Dow, 1991; Howland, 2008). Mariotto et al., (2006), projected that there will be approximately 1,522,348 colorectal cancer survivors in 2020, a 54 percent increase from the year 2000. Survival rates are projected to increase due to improved screening, more effective treatments,

and advances in preventing recurrences in all types of cancers (Hewitt, Greenfield, & Stovall, 2005; Rowland et al., 2004; Rowland & Yancik, 2006).

Background and Significance

Work and the Cancer Survivor

Participation in the workforce by cancer patients and survivors has been described by clinicians, survivors, and researchers as a way to improve mood, quality of life (QOL), and survival (Main, Nowels, Cavender, Etschmaier, & Steiner, 2005; Nachreiner et al., 2007; Sanchez, Richardson, & Mason, 2004; P. Schultz, Beck, Stava, & Sellin, 2002; Waxler-Morrison, Hislop, Mears, & Kan, 1991). Researchers who have studied the advantages of work have focused on how work can contribute to maintaining cancer survivor self-esteem, QOL, individual stimulation, social contacts, and financial independence (Greenwald et al., 1989; Peteet, 2000). However, Hewitt, Rowland, and Yancik (2003) noted that cancer survivors of all types are less likely to have a job, less likely to be able to work because of health, and limited in their ability to work compared to those without cancer. Furthermore, cancer survivors have one of the highest reported prevalence rates of work limitations compared to people with other chronic illnesses, such as heart disease and arthritis (Kessler, Greenberg, Mickelson, Meneades, & Wang, 2001). In spite of work limitations, Kessler et al. (2001) reported that 88 percent of employed people who develop cancer remain at work both during and after a cancer diagnosis.

Changes in the Work Pattern of the Colorectal Cancer Survivor

Bennett et al.'s (2008) study, which included colorectal cancer survivors, revealed that 38 percent of previously employed survivors had reduced work hours at 6 months following diagnosis, and that within 24 months, household income had decreased by 37 percent. In a large population-based cohort of working adults with colorectal cancer, 65 percent continued to participate in the workplace by one-year after diagnosis but 33 percent of those who returned to work by one year following treatment completion reported a reduction in work hours (Gordon, Lynch, & Newman, 2008). Bradley and Bednarek (2002) reported that colon cancer patients were more likely than lung, breast, or prostate cancer patients to reduce their workloads. A reduction in hours worked after diagnosis and treatment can be the result of declining functional status, both physical and emotional, which also may impair work productivity (Bennett et al., 2008). The failure of some survivors to recognize their need to seek support at work when needed may also contribute to impaired productivity (Wells et al., 2012). A significant reduction in personal household income can create an additional burden of illness for cancer survivors and their families. The financial burdens that result from cancer can have a detrimental impact on QOL and well-being (Muennig, Franks, Jia, Lubetkin, & Gold, 2005; Short & Mallonee, 2006).

Presenteeism and the Colorectal Cancer Survivor

Problems experienced by the colorectal cancer patient during treatment can persist following treatment, sometimes for a prolonged time. Consequently, when colorectal cancer survivors re-enter the workforce, they are faced with the long-term side-effects of

treatment that can potentially interfere with work productivity. Without access to sick pay benefits, health insurance and transportation, the colorectal cancer survivor's work status and productivity can be impaired and result in financial instability and declining work ability (Hemp, 2004; Hoffman, 2005). Other factors that can influence work status and productivity of the colorectal cancer survivor include an inability to access accommodations, feeling socially stigmatized, and experiencing psychological distress (Spelton, Sprangers, & Verbeek, 2002). Employees with psychological problems such as depression, which is prevalent in colorectal cancer survivors, are seven times more likely to exhibit increased presenteeism and over two times more likely to take sick days (Druss, Schlesinger, & Allen, 2001; Massie, 2004; Saarvala, 2006). Productivity losses attributed to depression are also among the most costly health conditions affecting the workplace (Kessler et al., 2001; W. Stewart, Ricci, Chee, & Morganstein, 2003).

Presenteeism is defined as reduced job performance and related productivity loss while working due to health problems (Aronsson & Gustafsson, 2005; Bergstrom, Bodin, Hagverg, Aronsson, & Josephson, 2009; Hemp, 2004). Such health problems can create work related barriers for the re-entry or continued gainful employment for the colorectal cancer survivor (Hemp, 2004). The reported predictors of return to work, including whether or not the person returns to work, and presenteeism specifically, have included individual related factors such as age, gender, race, marital status, education, health related quality of life, and depression in the colorectal cancer survivor (Bradley & Bednarek, 2002; Spelton et al., 2002; Spelton et al., 2003). Other predictors such as disease and work-related factors have been shown to affect patterns of return to work

including disease stage, type of treatment, time since diagnosis, occupation, company size, sick pay use, and health insurance status (Munir, Yarker, & McDermott, 2009; Taskila-Brandt et al., 2004). There has been far less investigative literature on how these factors influence presenteeism.

Organizational Sick Pay Policy

One of the fundamental aims of presenteeism research is to supply employers with guidelines for providing cost effective interventions to reduce presenteeism. Employers are only beginning to understand the costly consequences of presenteeism which will likely continue to increase if pre-emptive measures are not instituted. Rising rates of presenteeism are evidenced in the results of the cross-sectional Research Administrator Stress Surveys (RASPerS) conducted in 2007 and 2010 (Shambrook, 2012). The purpose of this survey, in part, was to estimate the difference in the presenteeism of research administrators between 2007 (n=607) and 2010 (n=1093). The findings of this study indicated that between 2007 and 2010 there was a 25% significant increase in presenteeism among research administrators.

Historically, employers have been concerned more about the direct costs of absenteeism although, according to some estimates, presenteeism costs outdistance the cost of absenteeism (Dew, Keefe, & Small, 2005). Lowe (2002) noted that programs offering incentives intended to reduce absenteeism could inadvertently result in decreased at-work productivity and generate a greater financial loss than absenteeism and direct medical costs combined. In fact, some employers who have shown concern for rising absenteeism rates have succumbed to instituting restrictive organizational policies

intended to reduce absenteeism that have inadvertently decreased at-work productivity rates (Bockerman & Laukkanen, 2009b) . Successful interventions aiming to reduce absenteeism paradoxically increase presenteeism if the underlying health problem is not resolved (Koopmanschap, Burdorf, Jacob, Brouwer, & Severens, 2005). Saarvala (2006) argued that if poor productivity persists and the underlying health problems of employees are not resolved, a linear relationship will exist in which absenteeism will substitute for presenteeism and eventually create new long- or short-term disability claims and additional personnel replacement costs.

Organizational policy and structure can be translated into interventions that can reduce presenteeism. For instance, employers can offer flexible compensatory time, a generous sick pay policy, wellness programs, and flexible work schedules, all of which are interventions that may be instrumental in the reduction of presenteeism. In one national survey of working men and women, 81 percent of employees indicated that paid sick leave was extremely or very important (Moccio & Geier, 2001). The lack of paid sick days can result in poor employee access to preventative health care or health maintenance that could increase the presenteeism costs of some conditions (Levin-Epstein, 2005).

In 2005, the Institute of Medicine (IOM) of the National Academies convened a committee charged with examining the medical and psychosocial issues faced by cancer survivors. Ten recommendations intended to improve the health and QOL of adult cancer survivors after primary treatment were released in the report *From Cancer Patient to Cancer Survivor: Lost in Transition* (Hewitt et al., 2005). One of the ten

recommendations of this breakthrough report was to implore policy makers to advocate for survivors by proposing legislation that would ensure access to fair employment practices and health insurance. This recommendation states: “Employers, legal advocates, health care providers, sponsors of support services, and government agencies should act to eliminate discrimination and minimize adverse effects of cancer on employment, while supporting cancer survivors with short-term and long- term limitations in ability to work” (Hewitt et al., 2005, p. 10).

Significance

Although there is a paucity of research investigating and systematically measuring presenteeism in the cancer survivor, this phenomenon has been of special interest to employers and policy makers in recent years. A generic method of measuring the degree to which health problems interfere with ability to perform job role-related activities has been challenging for researchers because of the diverse nature of industries, varying company size, and workforce cultures (A. B. Schultz & Edington, 2007). However, several validated measurement tools are available and being used (Kessler et al., 2003; Koopman et al., 2002; Lerner & Amick, 2001). Advancements in measurement of health-related work productivity have provided insight into the impact of many health conditions (Collins et al., 2005; Kessler et al., 2001; Koopman et al., 2002; Lavigne, Griggs, Tu, & Lerner, 2008; Lerner et al., 2004; Sanderson, Tilse, Nicholson, Oldenburg, & Graves, 2007), but research conducted to measure work productivity of the colorectal cancer survivors is missing. The degree to which health problems interfere with aspects of job performance and work limitations specific to the colorectal cancer patient has not been

reported recently. Nor, is it known, how impaired job performance, impaired task performance and productivity loss of the colorectal cancer patient compare to those of non-cancer populations.

Often colorectal cancer survivors have side-effects from disease and treatment that create unique barriers to functional status and often compromise the ability to work. Colorectal cancer survivor sick pay use may function as a mediator and alter the relation of individual, disease, and work related factors to worker productivity by enhancing improvements in workplace accommodation (Munir et al., 2009). A flexible sick pay policy can provide the colorectal cancer survivor with an opportunity for full recovery in a reasonable period of time for gradual re-entry to the workplace after treatment.

Study Purpose

The policy of interest for this review is organizational sick pay policy. The literature reviewed for this study was gathered from historical, sociological, political, and economic perspectives to describe how various factors and workplace policy influences cancer survivors in the U.S. Specifically, researchers from numerous academic fields suggest that the loss of gainful employment for many individuals with chronic illness can negatively affect individual well-being in today's socioeconomic climate (Bradley & Bednarek, 2002; Goetzel, Hawkins, Ozminkowski, & Wang, 2003; Goetzel et al., 2004; Hillier, Fewell, Cann, & Shephard, 2005; Lundy et al., 2009). Therefore, the purpose of this study is to understand and explain outcomes related to work patterns and presenteeism of colorectal cancer survivors that are affected by organizational sick pay policy.

Specific Aims

The specific and primary aim of this retrospective survey study is to:

1. describe changes in the work pattern of colorectal cancer survivors during and after treatment;
2 examine the relations of individual-, disease-, and work-related factors to the work pattern and presenteeism of colorectal cancer survivors after treatment; and
3. examine the relationships between individual, disease, and work-related factors to adequate sick pay policy of colorectal cancer survivors after treatment.

Conceptual Framework

The Conceptual Model of Nursing and Health Policy (Fawcett & Russell, 2001; Russell & Fawcett, 2005) and the Pathways to Work Life Recovery (Spelton et al., 2002) guided the design, selection of variables, and specification of the relationship between variables. The conceptual-theoretical-empirical structure is depicted in Figure 1.

Conceptual Model of Nursing and Health Policy (CMNHP)

The CMNHP focuses on public, organizational, and professional policies (Russell & Fawcett, 2005). Public policies are legislation developed by nations, states, cities, and towns that have an influence on individuals, groups, communities, and health care organizations. Organizational policies are developed by employers and professional policies are discipline-specific standards or guidelines that are developed to help guide professional practice in the field based on evidence based practice. The particular policy of interest for this study is employer sick leave policies.

The CMNHP identifies three policy components: service, personnel, and expenditures (Fawcett & Russell, 2001; Russell & Fawcett, 2005). The policy component that is most appropriate for this study is health care expenditures defined as the "costs of health care services incurred by people, providers, payers, and society" (Russell & Fawcett, 2005, p. 321). In this study, expenditures are represented by the cost of sick pay benefits associated with the burden of illness in the workplace due to employee presenteeism and work patterns.

The CMNHP also identifies four interacting levels of nursing and health policy focus and outcomes. The descriptive levels of nursing and health policy in this conceptual model are consistent with the concerns of health policy researchers: quality, cost, and access (Fawcett & Russell, 2001; Russell & Fawcett, 2005). Work patterns are defined as rates and time to return to work, changes in work schedules or changes in hours worked, and lapses in employment due to retirement or disability. In particular, the policy focus of this study is defined by level 3. Specifically, access to employment for the colorectal cancer survivor should be fair and equitable. Additionally, the distribution of employer costs incurred by the burden of illness should be allocated fairly and without prejudice. Employers have been the sponsors of fringe benefit packages, which typically have included sick pay, paid leave, pensions, and savings plan benefits and therefore are in a position through organizational policy to address inequities in the workplace and assist in maintaining equity of access to employment through accommodation. The policy outcome for level 3 is represented by the degree of work limitations, in the form of presenteeism of colorectal cancer survivors in the workplace.

Pathways to Work Life Recovery

Spelton (2002) initially developed the "Pathways to Work Life Recovery" model on the basis of a literature review of studies conducted between 1985 and 1999 and an adaptation of the World Health Organization (WHO) disability model (Figure 1). The Pathways to Work Life Recovery model was further refined in two studies, a prospective cohort study examining the relation between cancer-related symptoms and return to work (Spelton et al., 2003) and the return to work experiences of colorectal cancer survivor (Sanchez et al., 2004). In accordance with the tenets of this model, the return to work experience is affected by three distinct factors: person, individual, or subject-related factors; disease and treatment related factors; and work-related factors (Figure 1). For the purposes of this study, person, individual, or subject-related factors include survivor characteristics including age, gender, race, marital status, education, depression, and HRQOL including global health status, functional status (physical, role, emotional, cognitive, and social), and physical symptoms. Disease and treatment related factors include stage of disease, time since diagnosis, and type of treatment. Work-related factors include occupation, company size, sick pay use, employment gap, and health insurance status.

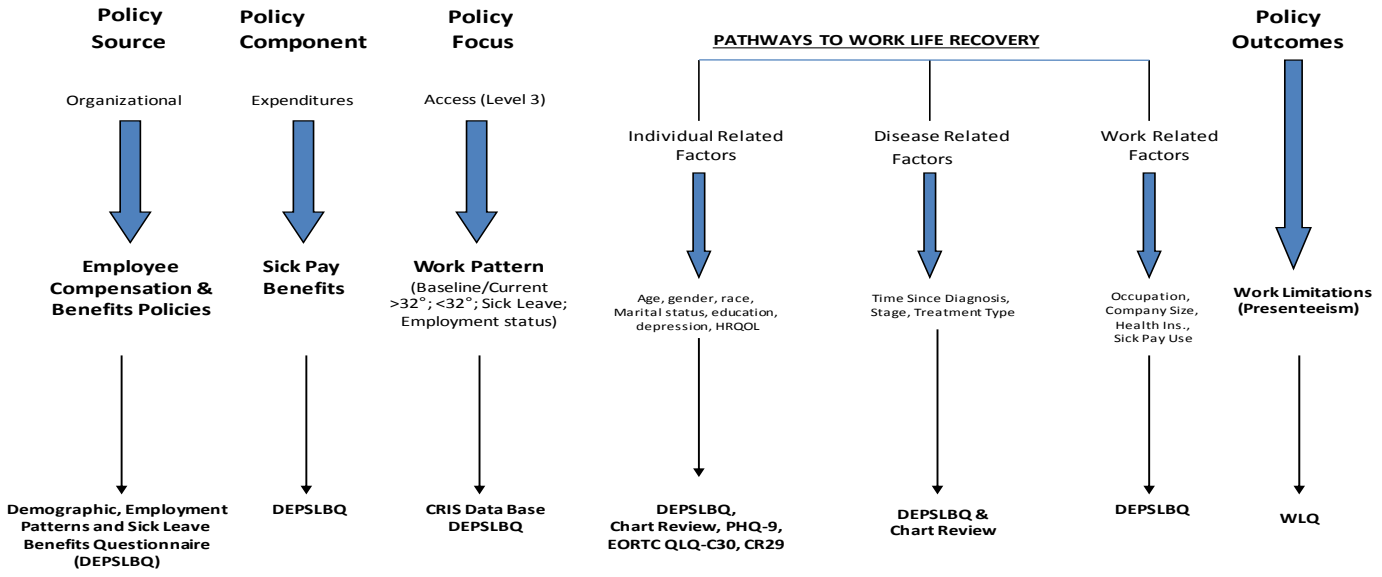


Figure 1. Conceptual Model of Nursing and Health Policy (CMNHP) and Pathways to Work Life Recovery.

CHAPTER TWO

REVIEW OF THE LITERATURE

Historical Context

The beginning of the 1980s brought broad-based legislation led by disability rights advocates who intended to protect individuals with disabilities in the workplace comparable to the human rights gains made by African Americans and women in the civil rights arena. Around the same time, labor union organizers and representatives facilitated the creation of collective bargaining agreements that included fair wage structures and more generous fringe benefits such as pension plans, health insurance, work time flexibility, and sick leave coverage. Prior to 1980, wage increases were priorities for unions but progressively union representatives played a pivotal role in other sweeping reforms including pressuring legislators to craft policy protecting workers in the areas of health and safety by reducing long hours, improving working conditions, and eliminating unfair labor practices that exploited workers (Clawson & Clawson, 1999). Union leaders secured decent wages, equitable treatment on the job, and work satisfaction (Barbash, 1964). As labor union successes evolved, many benefits gained from union membership, including systemic wage increases, improved working conditions, and a greater availability of fringe benefits, shifted to the non-union private sector market. This phenomenon was known as the union threat effect (Blum, 1997; Mishel & Walters, 2003).

After the mid-1980s, labor union membership declined significantly. Parallel to the decline of union support in the 1980s and 1990s, the advent of the new global economy hampered U.S. domestic labor representation and a large component of the blue collar American labor force was replaced by a foreign residing labor market that was without representation. Declining economic conditions in the 1980s also had a strong influence in structured employee compensation packages. Employee apprehension surrounding job security replaced issues around pay increases and expanded benefits (Stelluto & Klein, 1990). Consequently, the inability of union organizers to expand widespread gains in employee benefits and wage increases through collective bargaining was evident. Simultaneously, during the eight years that President Reagan was in office (1981 – 1989), the Republican Party became markedly more conservative, and disability advocates were forced to concentrate on protecting the gains achieved in the 1970s.

The 1990s was a period of global awareness of human immune deficiency virus (HIV), advances in American race relations, and concern for racial and gender equality more than any time since the 1960s. Even moderate Republicans broke their ties with their party leadership in the 1990s by voting for minimum wage increases, overtime legislation, and Social Security reform (Dark, 2000).

New legislation for persons with disabilities did not materialize again until 1990 when the Americans with Disability Act (Schneider et al.) was enacted. This legislation is a model of political consensus and bipartisan cooperation (Hogan, 2003). President George H. W. Bush signed the ADA on July 26, 1990, which was described by some as a milestone in the history of the disability rights movement and cited by President Bush as

one of the greatest accomplishments of his administration. Prior to the passage of the ADA, programs that targeted the disabled population were administratively dispersed throughout numerous governmental organizations and for the most part were designed only to provide income support to the disabled. Negative societal attitudes in the workplace toward those with disabilities have been well documented in the literature, and the ADA was intended to protect individuals with disabilities from discrimination by removing barriers that prevented participation in the workplace (Blanck, 2000; Bowman, 1987; Brostrand, 2006; Cartwright & Kim, 2006; Gilbride, Stensrud, Ehlers, Evans, & Peterson, 2000; Hernandez & Keys, 2000; Thomas, 2001; Vash, 2001).

The cancer survivor has not historically been considered disabled but legislative changes to the ADA enacted in 2008 have been more inclusive of those individuals who have health issues that compromise major life activities such as ability to work. Many cancer survivors were excluded due to the law's intentionally vague definition that left eligibility decisions to the discretion of governmental agencies and bureaucrats. The expansion of statutory definitions have been more inclusive for those individuals who experience limitations in major bodily functions such as digestive and bowel function that can occur episodically or during periods of disease free remissions and substantially limit a major life activity. In fact, debilitating physical symptoms have been reported up to 4 years after treatment in colorectal cancer patients in the workplace including fatigue, diarrhea, constipation, pain, cramps, or abdominal discomfort, and negative feelings about body appearance (Schneider et al., 2007). This change in definition has been particularly advantageous for the colorectal cancer survivor in the workplace but other

legislative approaches to address the transition back to work after a brief or chronic illness intended to protect the worker have been more recent.

In 1993 the Family Leave Insurance Act (FMLA) was ratified to allow those with a serious illness and/or their caregivers to take unpaid leave for health problems for up to 12 weeks, taken all at once or in blocks (Messner & Patterson, 2001). An analysis of the 1996-1998 Employee Benefits Survey conducted by the Institute for Women's Policy Research disclosed that 48 percent of all workers did not have paid sick leave (Lovell, 2004). In 2009, it was estimated that 61 percent of private industry employers provide paid sick leave but only 33 percent of those employees in the lowest 25 percent wage percentile have access to paid sick leave (U.S. Bureau of Labor Statistics, 2009). For those employees with accrued paid sick leave, there is some financial relief but for those who do not earn sick leave, there is no compensation during periods taken off for illness or treatment.

Political Context

In 2000, the Department of Labor (Patrignani et al.) issued the FMLA survey report, "*Balancing the Needs of Families and Employers*" analyzed workers and employers regarding leave taken for an 18 month period between 1995 and 2000 (Cantor et al., 2001). Sixty percent of FMLA eligible workers surveyed could not afford to take a leave. Among those individuals who did take FMLA leave, 34 percent received no wage compensation. Over 59 million American workers, nearly half the workforce, do not have access to paid sick days (Lovell, 2004). According to the Bureau of Labor Statistics, 27 percent of private sector workers who work full time and 74 percent of part-time workers

were not eligible for paid sick leave. Lower paid workers are especially vulnerable; few more than one in five lower income workers have paid sick leave compared to three out of four upper income wage earners (U.S. Bureau of Labor Statistics, 2009). Consequently, many employees continue to work while sick, which does not allow for physical and psychological recuperation and may worsen minor conditions following treatment that are unique to the colorectal cancer population because of compromised organ function. In particular, activities of daily living, including work, are compromised by the physical symptoms of diarrhea, gastrointestinal upset, nausea, and vomiting (Aronsson & Gustafsson, 2005; Aronsson, Gustafsson, & Dallner, 2000; A. Earle & Heymann, 2006; Grenon & Chan, 2009; Munir et al., 2009). Although the FMLA was an extremely important and progressive piece of legislature, more recent federal and state proposals call for the expansion of this law to include paid leave financed by an additional payroll deduction that would fund periodic short-term absences and accommodate employees who need to attend to their own health needs.

Two legislative proposals that are intended to lessen the economic burden as a consequence of lost earnings due to acute and chronic illness have been put forth. The Healthy Family Act of 2009 (HR 2460) was introduced in the 111th Congress. This legislation would require employers with 15 or more employees to provide seven days of sick leave per year and would allow employees to use this time to attend to their own medical needs or to seek medical attention when needed. According to a study conducted using the National Health Interview Survey, it is estimated that this legislation would generate as much as 1.8 billion dollars of increased productivity a year (Lovell, 2005).

The Family Leave Insurance Act of 2009 (HR 1723) has been introduced to fill the gap for those who cannot take unpaid leave – especially in difficult economic times. Employers are not required by law to provide paid sick days for workers with only two exceptions in the U.S., Washington, D.C. and San Francisco, CA. This proposed federal legislation would create a new trust fund designating the U.S. Department of Labor to administer the program. It is financed equally by employers and employees, who will each contribute 0.2 percent of employee wages.

There are many variations of these proposals that are introduced at all levels of government: federal, state, city, and town. The supporters and originators of these bills were from a variety of advocacy groups such as the National Partnership for Women and Families, Institute for Women's Policy Research, National Foundation for Infectious Disease, and the Kaiser Family Foundation.

Companion proposals for paid sick leave have also been introduced at all levels of government and organizations including federal, state, city, town, organized unions, and other special interest groups. Some of the proposed legislation took the form of incremental modifications of the FMLA such as the Healthy Families Act of 2009 (HR 2460), which was re-introduced in 2010 and which allows Americans to earn paid sick time. Paid sick time means compensated leave that can be earned by an employee for use during an absence. Under this act, up to 56 hours per year at a rate of one hour every 30 hours worked would be considered a reasonable accommodation, providing employees to have an opportunity to address their own health needs and the health needs of their

families without employer interference. Health care needs include recovery in response to short- and long-term illnesses.

This is especially relevant to the colorectal cancer survivor population and is a means to ensure that time off spent to meet health care needs will aid in the full recovery from the symptoms of disease and treatment in the long run. Additionally, the provision of paid sick time for routine medical care facilitates' identification of early symptoms that may otherwise translate into emergency care. This policy mechanism conceivably will reduce healthcare costs to businesses and patients. Finally, employees who are in good health in theory will be able to improve their labor productivity and lessen employee turnover. Some of the current advocacy groups supportive of the Healthy Families Act of 2009 include the National Partnership for Women and Families, the Fairness Initiative on Low-Wage Workers, and the National Association of Working Women.

The greatest opposition to the Healthy Families Act of 2009 has stemmed from Republican House and Senate legislators who suggest that this bill creates a rigid government that imposes mandates on employers. Further, employer group opponents such as the U.S. Chamber of Commerce claim that the bill would hurt employers that are struggling in a poor economic climate. Increased cost estimates as a result of this bill as calculated by the Chamber of Commerce range from $71.8 billion per year in annual payroll, averaging $886 per full-time employee. Besides concerns surrounding the costliness of this bill, opponents suggest that abuses will occur, widespread and creative

programs are already in existence, and claim that supporters do not understand basic employment benefit design methods (Rent-to-Own Industry News, 2007; Taggart, 2007).

Other legislators took an alternative approach to reform by introducing separate new legislation. The Family Leave Insurance Act of 2009 (H.R. 1723) is intended to provide paid family and medical leave benefits to require employers who are bound by the FMLA to join the program or establish voluntary plans. This recent Federal legislative proposal will also support those recovering from cancer. This legislation would create a new trust fund to run the program and would be financed equally by employers and employees. This act would be managed by the U.S. DOL which would contract with states to administer the program. To date, six states or territories (California, Hawaii, New Jersey, New York, Rhode Island, and Puerto Rico) have other short-term disability laws that require employers to provide or voluntarily contribute to short-term disability benefits for individuals with serious health conditions that are temporarily unable to participate in gainful employment because of physical, psychological, and functional challenges (Survivorship A-Z, 2009).

Unions became less involved in social movements in the 1960s such as civil rights activities that were ultimately addressed through governmental regulation and organizations (Clawson & Clawson, 1999). Because union leaders have progressively taken a more visible role in political influence through public policy, there has been some backlash from both pro- and anti-union electorates due to the collaborative partnerships with unpopular special interest groups (Dark, 2000). Nevertheless, the Democratic Party has become an important ally of labor unions. Alternatively, conservative political

pundits with anti-union sentiment claim that unions are monopolies that sacrifice individual rights and embrace collective rights that negatively affect many workers (Medoff & Freeman, 1984). The relationship between organized labor and political parties continues to be a controversial topic (Durrenberger, 2007; Fisk, 2001).

The Obama administration has supported labor supportive legislation despite challenging and unpredictable economic conditions. For instance, the appointment of Labor Secretary Thomas Perez, who is known to support the working poor, has congratulated large retail employers who offer higher wages and better benefits than their big-box competitors (Jamieson, 2013). Additionally, President Obama has proposed the appointment of known labor supporters to the National Labor Relations Board (NLRB), which became a vehicle of the anti-union offensive in 1980s (Burawoy, 2007). In conjunction with a weakening labor movement and a decline in advances of organized labor, Democratic leadership is actively making progress through more vigorous implementation of legislation.

Sociological Context

Social scientists, mainly sociologists, study how interest groups and their policies and/or ideologies are implemented and how these and other social forces have a part in sustaining or erasing socio-economic inequities including those related to the distribution of the health and well-being of individuals and populations. Some sociologists suggest that the prioritizations related to population health and inequalities in societies are dependent on traditional ideologies and the political history within that society (Kawachi, Wilkinson, & Kennedy, 1999; Navarro & Schmitt, 2005; Navarro & Shi, 2001).

Navarro and Shi (2001) suggest that United States (U.S. Bureau of Labor Statistics) policy is historically a liberal Anglo-Saxon political and economic model when compared internationally up to the 1990's. In this scenario market forces have been predominantly strong and benefits have been gained in the labor market through collective bargaining. Accordingly, progress in providing greater social equity in the form of fair wages and employee benefits have been gained through the collective bargaining process and the responsibility for providing for those in need has primarily been supported by the private sector. The U.S. is a nation with less of a redistributive economy compared to more social democratic traditions as in Sweden, Finland, Norway, Denmark, and Austria (Navarro & Shi, 2001). Many supporters of the U.S. liberal model recommend that there should be deregulation of the labor markets and a reduction in public expenditures (Navarro & Shi, 2001). In contrast, Klass (1985) suggested that the U.S. is pluralistic, rather than liberal because of some significant differences from the liberal model, such as provisions for Social Security benefits, unemployment insurance, and Workers Compensation. However, these so-called safety net programs historically have make up a low percentage of the Gross National Product (GNP) or government revenue attributed to social welfare programs compared to other industrialized nations (Klass, 1985). When considering the incremental changes to increase employee benefits that are viewed as market threats to big business, it is not surprising that legislation for paid sick leave is more prevalent in social democratic countries compared to the U.S., an economy that relies on a free market system. Navarro and Schmitt (2005) propose that there is an inherent divergence between economic efficiency and equality. In the U.S. it is

challenging to maintain a free market economy alongside policies that support social and economic equality.

Changes in the configuration of the U.S. labor force have had a significance influence on economic equality including wage and benefit structures, alternative work schedules and benefit packages (Blau, Ferber, & Winkler, 2006). The composition of the U.S. labor force participation rates are shifting toward a more balanced age distribution (young and old), a higher proportion of women and minorities, and those with competing demands who are challenged with family responsibilities such as caretaking for younger and older dependents that traditionally have not affected the workforce. The consequence of this changing shift in demographic patterns will have a substantial bearing on the future workforce, and potentially on the business environment, wages, compensation benefits (including adequate paid sick days), and political priorities. The Employee Benefit Research Institute (Employee Benefit Research Institute) investigators assert that, in response to this shift, there has been a growing ability for workers to participate in flexible benefit plans that can be tailored to improve the economic security of individuals and their families (Employee Benefit Research Institute, 2009). Flex benefits can also be a mechanism for employers to save costs by offering tax free matching contributions for employees versus unqualified and fully subsidized employee benefits. Due to the fundamental changes in family structure since the 1980s, traditional compensation packages are less appealing to employees (Stelluto & Klein, 1990).

Changes in the age distribution of the U.S. working population have been one of the most important demographic transformations in the labor market. As the baby boomer

cohort has grown older the median age of workers climbed from less than 35 years old in 1980 to almost 41 in 2005. This rising trend of aging workers in the labor force is projected to continue until at least 2020 (DiCecio, Engemann, Owyang, & Wheeler, 2008). Another significant demographic trend has been the increasing participation of both married and unmarried women in the workforce. Many factors have been attributed to this change in workplace composition that began in the 1960s, including changes in societal attitudes that made it more acceptable for married women to work. Alternatively, there has been a decline of men in the workforce partly attributed to the availability of disability insurance, which has given disabled workers more incentive to leave the labor market. Lastly, labor force participation rates have increased in racially diverse groups although rates vary across ethnic groups (DiCecio et al., 2008). Older workers, women, and racially diverse groups that make up a significant number of workers in the U.S. market has shifted the demand for more traditional compensation and fringe benefit packages to needing flexible work schedules or shortened work weeks (Ciampa & Chernesky, 2013)

Economic Context

Although continued employment or return to work after a diagnosis of cancer has been investigated, the timeline for full recovery remains uncertain. Employers are becoming increasingly concerned about the rising indirect costs of health and health problems including presenteeism. The cost of presenteeism has been more costly than absenteeism and disability benefits combined. These are also considered indirect costs.

Indeed, it has been estimated that presenteeism costs the U.S. economy $180 million annually in lost productivity due to illness (Collins et al., 2005; Levin-Epstein, 2005).

The productivity or so-called indirect costs to the employer as a consequence of presenteeism stem from health-related problems such as reduced work output, mistakes on the job, and failure to meet production targets (A. B. Schultz, Chen, & Edington, 2009). Additionally, the consequences of presenteeism for the chronically ill employee have been implicated in the exacerbation of existing medical conditions, decline in QOL, and others' negative perceptions of their performance, which could potentially create a hostile working environment (Johns, 2009). The tendency for employees to work while ill has been reported to be more prevalent in workplace organizations that have punitive sickness absence programs. Stressful workplace environments where workers feel considerable pressure to work when ill can lower productivity and eventually increase absenteeism rates (Hillier et al., 2005).

The establishment of a relationship between illness, treatment, and work performance has provided some insight into the costs of presenteeism, which have been quite large and in many instances exceeding the cost of business medical expenses. Goetzel (2004) articulated the analysis of total health and productivity related expenditures using administrative data sources and self-report data on presenteeism. In this study, the total cost of productivity losses were combined with the Medstat MarketScan Health and Productivity and Management (HPM) database. The HPM database contained person level information for 374,799 employees over a three-year period. This database includes information regarding benefit plan enrollment, absence

records, and short-term disability claims. Workers included in this database were employed in six large corporations with locations in 43 states. The estimated dollar impact due to productivity losses per employee per year averaged $144.01 or 53 percent of total expenditures that were due to presenteeism. Considering that it is estimated that there will be over 1.5 million cancer survivors by the 2020, a large percentage will participate in the labor market and may potentially experience difficulties in the workplace. Additionally, the prevalence of CRC is expected to increase from 0.36% to 0.46% from 2000 to 2020 (Mariotto et al., 2006). Survivorship rates will likely increase as new treatments are discovered that will extend the lives of CRC survivors.

The costly consequences of absenteeism have been in the forefront of many employers do but are not systematically measured. Estimates for the cost of absenteeism, (1%), presenteeism (6.8%), and medical care (2.3%) in the workplace due to chronic illness was estimated to be 10.1% of total labor costs in 12,397 employees in a large U.S. chemical company (Collins et al., 2005). In this study it is evident that presenteeism far outweighed the cost of absenteeism which heightens awareness of a growing problem for employers.

Colorectal Cancer

Cancers that develop in the colon or the rectum have common characteristics including risk factors, symptoms, and screening recommendations (American Cancer Society, 2008). Both organs are part of the digestive system that enables the body to transform food into energy and dispose of solid waste. Some risk factors for developing colorectal cancer include family history, chronic inflammatory bowel disease, physical

inactivity, obesity, diabetes, diet, smoking, and moderate alcohol intake (Mihajlovic-Bozic, 2004).

The usual progression of colon cancer begins with a noncancerous polyp, which accounts for 75 percent of all colon polyps. The adenomatous polyp (adenoma) is of greater concern. Nearly all colorectal cancers are thought to develop from prior adenomas and more than 50 percent of adenomatous polyps become cancerous. As the polyp grows, symptoms become more likely and can include rectal bleeding, fatigue, changes in bowel habits, abdominal discomfort, anemia, or bowel obstruction. Fortunately, if malignant polyps are detected early, 90 percent of patients survive at least 5 years (American Cancer Society, 2008).

The degree to which a colorectal cancer has spread is described and analyzed by two methods: clinical and pathological staging. The American Joint Committee on Cancer (AJCC) TNM staging system combines both clinical and pathological staging: T describes the size and spread, N describes the extent of spread of nearby lymph nodes, and the M indicates whether cancer has spread to other organs of the body. The AJCC TNM staging system is used to describe the extent of cancer using both numbers (1-4) and sub-classifications using small letters to provide greater detail. Prior to removal of the tumor a clinical stage is described as localized, distant, or metastatic. Localized colon cancer, or cancer that has grown into the wall of the colon and rectum but has not extended though the wall to nearby tissues and is usually managed with surgery to remove the tumor as well as surrounding colon tissue and nearby lymph nodes. If the surgeon suspects that there could be a recurrence due to invasion into other tissues or

regional stage disease, radiation therapy or adjuvant chemotherapy may be recommended after surgery. Distant or metastatic stage is a case where the cancer has spread to distant organs and tissues, such as the liver, lungs, peritoneum, or ovaries. Surgery is not recommended for all patients with distant or metastatic disease but when it is performed it is to prevent blockage of the colon and other local complications. Chemotherapy, radiation, and biologically targeted therapies may be given alone or in combination to relieve symptoms and prolong survival for colorectal cancer patients (American Cancer Society, 2008).

The treatment of colorectal cancer involving surgery sometimes requires a temporary or permanent colostomy. In some cases a colostomy can be avoided if the surgeon is able to remove the cancer and connect the healthy tissue, allowing normal elimination for the patient. Because this is not always possible an opening or stoma in the abdomen is a surgical procedure (colostomy) that is performed to facilitate the removal of body waste. Approximately 1 in 8 people with rectal cancer will require a permanent colostomy (American Cancer Society, 2008).

The most well-known chemotherapy agents for the treatment of colorectal cancer include Fluoropyrimidines (5-FU and capecitabine), oxaliplatin-based regimens (leucovorin, 5-FU, and oxaliplatin), Irinotecan-based regimens (folinic acid, 5-FU, and irinotecan), and biological agents or targeted agents (Bevacizumab, Cetuximab, and Panitumumab) (Grenon & Chan, 2009; Wilkes, 2005). The most common side effects of the Fluoropyrimidines, oxaliplatin- irinotecan- based regimens include neutropenia, stomatitis, gastrointestinal side-effects, hand-foot syndrome, nausea and vomiting.

Biological or new targeted therapies produce side-effects unlike those of chemotherapy including hypertension, wound healing complications, proteinuria, pulmonary toxicity, skin-related toxicities, and bleeding (Grenon & Chan, 2009; Wilkes, 2005).

It is important to distinguish between the signs and symptoms of toxic treatment and signs and symptoms of disease. Colorectal patients experience significant signs and symptoms at presentation that are related to the disease process including anemia, a palpable mass, rectal bleeding, changes in bowel habits, weight loss, and abdominal pain. For colorectal cancer survivors one year after diagnosis, the most severe symptoms reported are fatigue, insomnia, constipation, and diarrhea which can be attributed to both treatment and disease (Arndt, Henrike, Stegmaier, Ziegler, & Brenner, 2004). Additionally, patients receiving radiation and a surgical colostomy have reported diarrhea, physical discomfort, and activity limitations up to 4 years after diagnosis more frequently than those colorectal cancer survivors without radiation treatment or a colostomy (Schneider et al., 2007).

Colorectal patients also receive external beam therapy (EBT) which is a method for delivering a beam of high-energy x-rays to the location of the tumor. The beam is generated outside the patient (usually by a linear accelerator) and is targeted at the tumor site. EBT is usually given five times a week for several weeks. The side-effects of radiation therapy are specific to the area of the body being radiated but there are some common side-effects that are experienced by patients treated for most types of cancers including skin irritation and fatigue. Complications of radiation therapy specific for those with colorectal cancer may include diarrhea or frequent bowel movements, appetite loss,

and redness of the skin where external x-rays enter the body. Generally, side effects stop gradually once treatment is discontinued but bowel function can continue to be compromised after treatment (Hayne, Vaizey, & Boulos, 2001).

Return to Work

The variables associated with continued employment or return to work of the CRC survivor can include individual, disease and work-related factors. These factors can also influence rates of return to work, reasons associated with gaps in employment and temporary lapses in employment.

It is documented that cancer survivors experience a great deal of trepidation surrounding the continuation, delay, or return to work during and after cancer treatment (Main et al., 2005; Maunsell, Brisson, Dubois, Lauzier, & Fraser, 1999; P. Schultz et al., 2002; Short & Vargo, 2006). Some employers claim that providing workplace accommodations such as a shortened work day or abbreviated work week will create undue hardship and productivity loss on business thereby jeopardizing an otherwise profitable company (Hoffman, 1997; Yarker, Munir, Bains, Kalawsky, & Haslam, 2009). According to the ADA employers are not required to make accommodations that would fundamentally alter the nature of a business or create undue hardship leaving some cancer survivors and/or disabled persons unable to return to work (Hoffman, 2005). Employers may consider accommodations that would benefit the employee such as a shortened work week working from home, or reduced travel unmanageable especially in smaller organizations. Consequently, some cancer survivors who are not fully recovered during or after treatment are not able to remain employed. Therefore, some employees choose to

take advantage of the ADA or FMLA, but obstacles for survivors who are applying for ADA or FMLA benefits include a lack of knowledge that is necessary for filing claims, fear of reprisal from employers, and misinformation or disinformation relating to eligibility (Feuerstein, Luff, Harrington, & Olsen, 2007; Geddes, 1995; Hoffman, 2005).

Some cancer survivors face symptom related barriers for long periods of time. For those survivors who are given the opportunity to return or continue work with a flexible schedule or reduced hours, the transition to work can be gradual. Symptoms that interfere with the ability to work can be debilitating but symptoms can often be mitigated and well managed with medication and psycho-educational interventions. Other survivors do not return to work because they are physically unable to continue a job this is physically demanding and others closer to retirement age may choose to retire rather than face insurmountable barriers such as an unfriendly or discriminatory environment (Bednarek & Bradley, 2005; D. E. Stewart et al., 2001).

Work Patterns

The impact of specific cancer type, treatment, and symptom burden is well supported in three literature reviews of factors associated with return to work and work ability. Two literature reviews conducted from 1985 to 2009 examined 78 studies focusing on employment and work-related issues in cancer patients (Mehnert, 2010; Spelton et al., 2002). Spelton et al. (2002) reviewed 14 studies conducted between 1985 and 1999 and Mehnert (2010) analyzed 64 studies conducted between 2000 and 2008 that focused on rates of return to work and factors related to employment and return to work in adult cancer patients. Taskila and Lindbohm (2007) reviewed 12 studies conducted

from 2002-2007 all inclusive of the Mehnert review with the exception of two additional studies investigating sociodemographic factors affecting employment and work ability of childhood cancer survivors (Langeveld, Stam, Grootenhuis, & Last, 2002; Nagarajan et al., 2007).

The literature revealed that colorectal cancer survivors follow predictable patterns of: (a) rate of return to work, (b) Changes in employment rates over time, (c) change in work schedule, and (d) temporary lapses in employment.

Rate of return to work

Spelton et al. (2002) reported that the overall mean rate of return to work was 62 percent of a sum total of 1170 cancer survivors in studies conducted between 1985-1999. These rates varied by age, cancer site, and time since diagnosis and treatment. Survivors younger than 50 years of age had higher overall rate of return to work (74%) compared to survivors who were over 50 years of age, who returned to work only 30 percent of the time. Mehnert (2010) summarized and reported similar overall rates of return to work. On average Mehnert (2010) reported that cancer survivors returned to work 63.5 percent of the time. The mean age of survivors in these studies was 50 years old, and younger age was associated with a greater likelihood of return to work (Mehnert, 2010).

Only two studies conducted between 1985 and 2009 focused exclusively on the transition or return to work of the colorectal cancer population (Gordon et al., 2008; Sanchez et al., 2004). Sanchez et al. (2004) reported an 89 percent average rate of return to work in 200 newly diagnosed colorectal cancer patients identified through California cancer registries. According to a study conducted in Australia of colorectal cancer

patients,Gordon et al. (2008) reported a rate of return to work of only 54 percent within 6 months of diagnosis although by one year the rate increased to 65 percent. There appears to be a wide variance in rates of return to work even within a fairly homogenous group of cancer diagnoses ranging from 54 percent rates of return to work to 89 percent.

Most recently, Earle et al. (2010) conducted a prospective cohort study of 2242 survivors of lung and colorectal cancer. Both colon and lung cancer patients were interviewed at 15 months after diagnosis in which only 29% returned to work. The percentage of colorectal cancer patients who returned to work at 15 months was 35 percent compared to 21 percent of lung cancer survivors.

Changes in employment rates over time

Return to work rates varied according to time since treatment or time since diagnosis. Spelton et al. (2002) reported that the overall mean rates of return to work increased if more time had passed since the end of treatment or diagnosis based on studies that examined time periods between three and six years after treatment and one to eight years after diagnosis. Mehnert (2010) reported summary tabulations of four time points of return to work following diagnosis also showing a steady increase over time. This increase was reported as an average rate of return to work at six months after diagnosis of 40 percent, 62 percent at 12 months, 73 percent at 18 months and 89 percent at 24 months. In particular, Verbeek, Spelten, Kammeijer, and Sprangers (2003) also reported a steady increase of return to work rates in 98 patients with a variety of cancer diagnoses including colon cancer. Rates of return to work were 49 percent at 6 months to 67 percent at 12 months.

Although Spelton et al. (2002) and Mehnert (2010) reported an overall steady increase in return to work over time, some individual study findings show opposite results. Bouknight, Bradley, & Luo (2006) conducted a longitudinal study that examined the return to work of breast cancer survivors; the rate of return was 82 percent at 12 months but within 18 months there was a decline of seven percent (Bouknight et al., 2006). Short (2005) also reported that although most survivors of a variety of cancers returned to work within the first year of diagnosis, 11 percent quit working for cancer related reasons within the next 3 years. Taskila-Brandt et al. (2004) reported that 78 percent of cancer patients were working at diagnosis but showed a 14 percent decline in employment rates within two to three years after diagnosis. These findings are consistent with a nationally based sample of cancer patients who were within two years of diagnosis and more likely to have jobs compared to cancer survivors two to 11 years after diagnosis who were not working due to health problems (Yabroff, Lawrence, Clauser, Davis, & Brown, 2004).

The results of studies of colorectal cancer patients in particular are mixed. Consistent with studies showing a decline in employment rates over time, Sanchez et al.(2004) reported a nine percent decline in return to work at five years following diagnosis. Conversely, Gordon et al. (2008) reported an 11 percent increase in employment rates at one year in a longitudinal study spanning only one year.

Change in work schedule

Work schedule changes were widely reported in studies. Bradley, Neumark, Bednarek, and Schenk (2005) reported that breast cancer survivors who remained

working decreased work by six hours from pre-diagnosis to post-diagnosis. Other researchers also reported that survivors reduced hours in order to accommodate treatment (Main et al., 2005; Maunsell et al., 2004). Bradley and Bednarek (2002) reported that colon cancer patients were the most likely to reduce work schedules compared to lung, breast, and prostate patients, yet 86 percent of those who reduced their schedules did return to their former schedules. Steiner (2008) investigated 92 survivors including colorectal cancer survivors who remained employed after cancer treatment in which 57 percent reduced work by more than four hours per week that was attributed to their cancer. Survivors also reported changes in job duties, employer, and occupation or industry.

Some researchers who examined work schedule changes reported that patients both increased and decreased hours. Gordon et al. (2008) reported that of those colorectal cancer patients who did return to work one year after diagnosis, 33 percent had reduced work hours, 16 percent had increased work hours, 16 percent experienced no change, and 35 percent ceased working.

Gudbergsson, Fossa, and Dahl (2008) investigated changes in the work situation of 431 early stage breast, prostate, and testicular cancer patients who returned to work after primary treatment. Changes in workplace, prior occupation, work tasks, becoming unemployed or early retirement were reported in 17 percent of cancer survivors. For those who reported changes in work situation there was a significantly higher proportion of part-time workers as well as poorer mental work ability compared to the group who did not make changes in their work situation.

Temporary lapses in employment

Verbeek (2003) investigated cancer survivors including those with colorectal cancer and reported that of the 67 percent of survivors who returned to work at one year, the time to return to work ranged from 4-651 days with a median of 293 days or approximately 10 months. Drolet, Maunsell, Mondor, et al. (2005) reported that absences lasted less than four months for 26 percent, 4-6 months for 24 percent, 7-12 months for 37 percent , and 13 months or longer for 12 percent in breast cancer survivors. Delays or lapses in return to work were examined and reported in another study of breast cancer survivors (N=270) in which 21 percent had not returned to work 12 months after treatment, 16 percent had not returned to work 24 months after treatment, and 14 percent had not returned to work at 36 months (Johnsson et al., 2007).

Regarding colorectal cancer survivors Sanchez et al. (2004) reported that 36 percent of survivors who returned to work greater than 60 days after diagnosis were considered to experience a delayed return. In that study, 64 percent of employed survivors returned to work within two months following diagnosis and 81 percent returned within five months showing upward trends over time to return to work.

Some researchers reported lapses in time to employment that were far less. Bradley, Oberst, and Schenk (2006) found that women treated for breast cancer missed an average of 44.5 days from work compared to men with prostate cancer, who missed 27 days from work on average. Patients receiving treatment for breast or prostate cancer required approximately one full month away from work. In a sample of 369 breast cancer survivors, reported lapses in return to work were even more encouraging. Sixty-nine

percent of the respondents continued working through treatment, 25 percent returned to work after treatment was completed, and less than five percent did not return to work (Mahar, BrintzenhofeSzoc, & Shields, 2008). Lapses in time to employment reported here are consistent with other studies of cancer survivors (Mehnert, 2010; Short et al., 2005; Spelton et al., 2002).

Individual-Related Factors and Work Pattern

The literature revealed that the age at diagnosis is known to have a strong influence on survivor decisions regarding pursuing work disability, early retirement, and a delay in returning to work. Most studies indicated that younger survivors were more likely to return to work but these findings have been challenged (Bednarek & Bradley, 2005; Bouknight et al., 2006; Drolet, Maunsell, Brisson, Masse, & Deschenes, 2005; Sanchez et al., 2004; P. Schultz et al., 2002; Spelton et al., 2003; Taskila-Abrandt, Pukkala, Martikainen, Karjalainen, & Hietanen, 2005). Maunsell et al. (2004) reported older age did not affect the work situation nor did it indicate that women with breast cancer retired earlier than those women without cancer. The findings of a pilot study conducted by Bednarek and Bradley (2005) indicated that individuals who retired prior to their cancer diagnosis were similar in all characteristics, including age, yet there was some evidence to indicate that those employed during treatment may have felt pressure to retire sooner than they would have otherwise.

The educational level of survivors was found to be a strong predictor of return to work. Bednarek and Bradley (2005) reported that a majority of cancer survivors who returned to work had attended some college or had a college degree. Short et al. (2005)

and Taskila-Brandt et al. (2004) found that survivors who had higher education levels and those who were employed at diagnosis were less likely to quit working than any other educational group. Less education was not only found to be associated with a lower likelihood of returning to work, but also delays in returning to work (Bouknight et al., 2006; Sanchez et al., 2004).

Gender had some bearing on the likelihood of returning to work or a delay in return to work. P. Schultz et al. (2002) reported that men were proportionately more likely to return to work than women. Bradley et al. (2006) reported that women treated for breast cancer missed more days from work than men treated for prostate cancer during treatment although in the months following a cancer diagnosis both groups required approximately the same amount of time off. Additionally, women survivors of colorectal cancer who had a partner, were older, and had less education were more likely to delay returning to work compared to male counterparts (Drolet, Maunsell, Brisson, et al., 2005; Sanchez et al., 2004).

In another study of breast cancer survivors at three months after diagnosis, marital status was not associated with work lapses (Satariano & DeLorenze, 1996). This was also found to be true in a study of colorectal cancer survivors in which marital status was not significantly associated with delayed return to work. However, for those survivors who did delay returning to work for more than two months, the likelihood was greater that they had a partner (Sanchez et al., 2004). Bradley, Bednarek, and Neumark (2001) found that if a spouse carried health insurance it was less likely that breast cancer survivors would return to work. Conversely, breast cancer survivors who carried their own health

insurance through their employer were more likely to continue or return to work (Bradley, Neumark, Luo, & Schenk, 2007).

Findings regarding the relationship between return to work and race has also been reported. P. Schultz et al. (2002) reported that proportionately more Blacks ($p < .001$) than Whites were unable to work. This is consistent with another study in which non-employment was twice as likely to occur in Black survivors than White survivors of cancer (Bradley et al., 2005). Blacks were also more likely to lack health insurance (Satariano & DeLorenze, 1996). Additionally, it was reported that 40.4 percent of African American women reported being on medical leave in contrast to only 25.8 percent of White women. Satariano and DeLorenze (1996) suggest that differences in the demands of everyday life such as the need for assistance with transportation and physical demands of a job varied between Black and White breast cancer survivors and may have contributed to a delay in return to work for Black women in this study.

The examination of health-related quality of life (HRQOL) is often measured by domains, which can include physical, psychological, social/functional, and spiritual world view or life meaning (Meneses & Benz, 2010). A better understanding of the long-term consequences of the treatment of cancer and knowledge of the general well-being of survivors is critical to understand how the HRQOL of colorectal cancer survivors can be maximized. Physical symptoms attributed to treatment and disease of the colorectal cancer survivor can include diarrhea, constipation, and abdominal discomfort (Schneider et al., 2007). Besides physical symptoms, socio-demographic, and clinical factors, other

HRQOL factors such as the functional and spiritual domains are also associated with return to work (Verdonck-de Leeuw, van Bleek, & Leemans, 2010).

Other factors that contribute to HRQOL such as positive reasons for returning to work were cited by survivors as well (Main et al., 2005). Some survivors believed that cancer had made them more goal focused. Others reported having a positive career change by leaving a job or making a career change (D. E. Stewart et al., 2001). Survivors reported that motivations to work also included having a healthy distraction and a place for accomplishment and self-worth (Hounshell et al., 2001). Survivors stated that if they felt supported by their employer or boss by being accommodated for taking time off for medical appointments, they were pleased with their work environment because of having the ability to reduce work schedules. Some studies provided evidence to suggest that perceived employer accommodations for cancer illness and treatment needs were associated with a greater likelihood of return to work (Bouknight et al., 2006; Bradley & Bednarek, 2002; Main et al., 2005).

Gainful employment or work participation by cancer survivors has been found to contribute to personal well-being and improved HRQOL; however, findings from other studies have been mixed. Maunsell et al. (2004) reported that survivors were more likely to value work less than before a cancer diagnosis. Some cancer survivors indicated that the cancer experience gave them a different perspective on life and work and its relevance in their lives and thereby survivors placed less value on work (Main et al., 2005). Drolet, Maunsell, Brisson et al.(2005) reported that breast cancer survivors had altered their priorities and subsequently retired, changed careers, or simply were no

longer working. Yet, researchers argue and have demonstrated that work can contribute to a return to normalcy, a positive self-identity, and improved self-esteem (Peteet, 2000). Therefore, the ability of cancer survivors to work is an important component for improvement in HRQOL.

Psychological distress in the form of depression can also have a major impact on HRQOL especially for cancer survivors (Meneses & Benz, 2010). There is an increasing concern that those who face life threatening illnesses such as cancer may be at a greater risk for psychological symptoms such as those related to depression (Arndt et al., 2004; Sprangers, Taal, Aaronson, & Velde, 1995). Depression occurs more often in those who experience considerable pain, high levels of physical disability, and severe illness (Adler & Page, 2008). In fact, Ramsey, Berry, Moinpour, Giedzinska, and Andersen (2002) reported that depression was significantly more prevalent in colorectal cancer survivors than the general population. Therefore, the risk of poor HRQOL and rising rates of depression in colorectal cancer survivors has stimulated more research to explore modifiable factors. Interventions can be work-directed that are aimed at workplace accommodation or patient-related interventions aimed at physical and psychological rehabilitation.

Depression has not only been shown to be a risk factor for unemployment of cancer survivors but a risk factor for unemployment in the general population (Carlsen, Dalton, Diderichsen, & Johansen, 2008). Moreover, depression is not only a risk factor for unemployment, but depression is the second most costly mental health condition for employers (Goetzel et al., 2003). Additionally, those survivors who reduced work hours

also reported more psychological symptoms or fears, specifically feeling anxious or feeling down or depressed (Steiner et al., 2008). Psychosocial problems such as depression related to job loss and employment discrimination are common among cancer survivors therefore an important factor (Hewitt et al., 2003).

Individual-Related Factors and Presenteeism

To date, there is a paucity of research measuring presenteeism of the cancer survivor and identifying the variables that influence presenteeism. Some researchers have reported responses of cancer survivor self-reported work disability, limitations, and health problems while on the job by posing questions as to whether physical, mental, or emotional problems impeded the amount or kind of work performed (Hewitt et al., 2003; Short, Vasey, & BeLue, 2008; Short et al., 2005; Yabroff et al., 2004). In a study of long-term survivors with lung, colon, breast, and prostate cancer, work limitations or presenteeism was measured based on one's ability to lift heavy loads or perform mental tasks that involved concentrating for long periods of time (Bradley & Bednarek, 2002) . Bradley et al. (2007) also investigated physical and cognitive disability in prostate and breast cancer survivors who stated that cancer had interfered with their ability to perform physical tasks, learn new things on the job, and analyze data.

In a study of breast, lymphoma, testicular, and prostate survivors, participants completed the Work Ability Index (WPI), a validated tool measuring self-reported work ability. The purpose of the WPI is to assess work ability during health examinations and workplace surveys (Ilmarinen, 2007). Age, education, and gender were also found to be factors that influenced presenteeism or work limitations. The findings of this study

indicated that older age, lower levels of education, and more co-morbidities reduced work ability, although less education did not significantly lower work ability of women in particular (Taskila, Martikainen, Hietanen, & Lindbohm, 2007). Taskila et al. (2007) also reported differences in presenteeism between genders. Impairment of physical work ability was more commonly reported in 28 percent of women and impaired mental work ability was more commonly reported in 23 percent of men. In another study of colorectal cancer survivors, women were more likely to be employed in occupations involving sedentary and light physical activity before cancer; therefore because disabilities are more common among those with physically demanding jobs,Gordon et al. (2008) suggested that females may be less likely to experience significant work limitations. Then again, Greenwald et al. (1989) found that age, education, and gender had little effect on work disability in cancer survivors. Nor did Satariano and DeLorenze (1996) report any association between marital status and being on disability leave in a sample of breast cancer survivors.

There is some indication that there may be an association between race and presenteeism. P. Schultz et al. (2002) reported that a greater proportion of Hispanic and Asian survivors were working than White and Black survivors in a sample of those survivors five years away from treatment in a major cancer center. Moreover, the majority of Black cancer survivors in the sample were unable to work.

The physical and psychological effects of colorectal cancer and its treatment can have a major impact on the HRQOL of cancer survivors resulting in a decline in functional status. Hewitt et al. (2003) investigated health-related and functional

limitations of cancer survivors that resulted in disabilities. Almost 17 percent of cancer survivors reported a complete inability to work and an additional 7.4 percent were limited in their ability to work due to physical limitations in daily function.

Self-reported global health ratings ware also associated with ability to work. In long-term survivors of colorectal cancer, Ramsey et al. (2002) found that 47 percent of colorectal cancer survivors who were at least five years from diagnosis rated their general health as “very good” or “excellent” and 15 percent rated it “fair” or “poor”. Yet even cancer survivors who report poor health status continue to work resulting in lower workplace productivity due to illness (Biron, Brun, H., & Cooper, 2006). Not surprisingly, reports of better role functioning were found in those colorectal patients working compared to those who were not working matched on age and gender (Arndt et al., 2004). Bockerman and Laukkanen (2009a) suggest that self-reported health status is correlated with presenteeism in ill workers.

Researchers of several studies strongly suggest that not only do individuals with depression have higher unemployment rates than those that do not, but depression is also associated with productivity loss and poor work functioning (Greco, Eckert, & Kroenke, 2004; Lerner & Mosher-Henke, 2008; Schroevers, Ranchor, & Sanderman, 2004). Steiner et al. (2008) reported that a majority of cancer survivors who returned to work had more physical symptoms such as lack of energy, nausea and vomiting, and psychological symptoms such as feelings of boredom, uselessness, anxiety, or depression all of which were associated with a reduction in work hours and a change in occupational

roles. Biron et al. (2006) reported that psychological distress manifesting as depression increased presenteeism propensity.

Disease-Related Factors and Work Pattern

The association between cancer type, cancer stage, and type of treatment in cancer patients has produced a wide variation in work patterns that have shown both increases and declines in employment over time. These differences can be attributed to the dissimilarities in the distressing symptoms that are directly related to a particular cancer diagnosis or the side-effects of diverse treatments. Therefore, there have been large disparities in the rate of return to work outcomes which has been shown to be a major predictor of disability (Taylor et al., 2004). Risk of unemployment or disability has been associated with extensive surgery, advanced tumor stage, and receiving both chemotherapy and radiation treatment. However, although disability was often dependent on tumor site and resulting treatment, researchers have reported other causes such as demographic and work related factors (Short et al., 2005).

A cancer diagnosis and resulting treatment have physical consequences that have been associated with the ability of the cancer survivor to return to work. Taylor et al. (2004) found pain, fatigue, depression, and poor function to be major predictors to return to work. In contrast, Spelton et al. (2003) found no significant relationship between return to work and physical factors, such as sleep problems, psychological distress, and work pressure yet poor health was often a reason for retirement (Bednarek & Bradley, 2005). Cognitive deficits such as difficulties in concentrating, difficulty learning new things, and

analyzing data also have been reported to influence the return to work for long periods of time (Bradley & Bednarek, 2002) .

It is apparent that both the diagnosis and treatment for different types of cancer can be more debilitating for some survivors. Some researchers have reported that the highest incidence of inability to return to work has occurred in lung and gastrointestinal cancer survivors (P. Schultz et al., 2002; Taskila-Brandt et al., 2004). Head and neck cancer was also a strong predictor of work related disability (Taylor et al., 2004).

Adjuvant treatment to achieve relapse free and long-term survival can include chemotherapy and radiation in colorectal patients that produce side-effects in an otherwise symptom free population. Treatment can result in complicated symptoms including diarrhea, proctitis, intestinal obstruction, stricture, and fistula often occurring long after treatment completion (DeCosse & Cennerazzo, 1997). In this case, time to return to work can be significantly longer especially for those who underwent chemotherapy or multimodal treatment (Balak, Roelen, Koopmans, Berge, & Groothoff, 2008). Taskila-Abrandt et al. (2005) suggest that retirement was very high among people having cancer who had a significant treatment regime that resulted in the lasting effects of fatigue and eventual retirement due to disability. In a study of 2956 colorectal cancer survivors, the risk of being retired (RR) was 1.17 times more likely compared to cancer free controls (Taskila-Abrandt et al., 2005).

In one meta-analysis, researchers investigated the association between unemployment and cancer type in a systematic review of studies conducted between 1966 and 2008 (de Boer, Taskila, Ojajarvi, van Dijk, & Verbeek, 2009). Part of this meta-

analysis consisted of 717 pooled gastrointestinal survivors, data revealed that there was an increased risk (48.8% vs 33.4%; RR, 1.44 [95% CI, 1.02-2.05]) of unemployment in gastrointestinal survivors compared to healthy controls. The highest risk for unemployment was among nervous system and nasopharyngeal cancer survivors yet no differences were found between blood, prostate, testicular cancers and healthy controls. Overall, cancers survivors were 1.37 times more likely to be unemployed and at higher risk for disability than healthy controls.

The research results of measured adjustment to a cancer diagnosis, both physically and psychologically, have been mixed. Schroevers, Ranchor, and Sanderman (2006) reported that the impact of cancer treatment on physical and psychological functioning improved substantially from three months to 15 months post diagnosis. At eight years following diagnosis, psychological functioning was comparable to referents, although physical functioning was significantly more prevalent compared to referents. In another study of colorectal patients with reported symptoms at four years after diagnosis, survivors reported a relatively low incidence of both physical and psychological symptoms that were quite similar to U.S. norms (Schneider et al., 2007).

Disease-Related Factors and Presenteeism

Symptom burden of disease and treatment can also interfere with productivity for those who do return to work during or after treatment. Lavigne et al. (2008) measured absenteeism and presenteeism in breast cancer survivors at least 12 months from treatment completion. Productivity was measured by higher scores on the Work Limitations Questionnaire (WLQ), a self-report measurement of productivity while

working. Possible factors related to productivity loss such as cancer, treatments, and demographic characteristics were investigated. The findings of that study revealed an inverse relationship between less productivity on the job and increased fatigue and hot flash symptoms. In another study of breast cancer survivors four years post-diagnosis, greater presenteeism measured with the WLQ occurred in survivors than in a cancer free comparison groups (Hansen, Feuerstein, Calvio, & Olsen, 2008). These survivors also reported more time off work, higher levels of fatigue, and increased depressive and anxiety-related symptoms compared to the non-cancer comparison group.

In a study of stomach cancer survivors findings indicated that difficulties performing work were due to increased fatigue and reduced work capacity (Lee et al., 2008). This finding is consistent with those of other investigators evaluating breast cancer although, interestingly, Satariano and DeLorenze (1996) found that those breast cancer survivors who were on leave were more likely than those who returned to work to experience fatigue and pain regardless that there were no differences in depression or physical symptoms such as nausea or other associated factors. Sanchez et al. (2004) reported that among the reasons given by colorectal cancer survivors for not returning to work included an inability to perform on the job (42%), medical reasons (28%), and/or their doctor advised against it (10%). Additionally, some survivors stated that they did not need to work or were laid-off. Bradley and Bednarek (2002) reported that more than 50 percent of long-term cancer survivors were unable to work due to poor health.

Brain tumor patients have also been investigated to determine the risks associated with work limitations at approximately four years since diagnosis. Not surprisingly,

compared to the non-cancer group, brain cancer patients had higher levels of fatigue, depression, anxiety, and cognitive limitations due to treatment and disease that resulted in significantly greater presenteeism (Feuerstein, Hansen, Calvio, Johnson, & Ronquillo, 2007).

Work-Related Factors and Work Pattern

The type of job or occupation was also shown to influence work patterns. Some survivors reported that they were unable to physically perform their jobs (Sanchez et al., 2004). Survivors with physically-demanding jobs had higher disability rates in one study (Short et al., 2005). Taskila-Brandt et al. (2004) demonstrated that as many as 12,542 cancer survivors with various cancers compared to matched controls had significantly varied employment rates by occupation. Survivors employed in more physically-challenging occupations showed a significantly lower probability of being employed than those in sedentary occupations as compared to matched controls (Taskila-Brandt et al., 2004). Findings from another study revealed that delays in return to work were attributed to treatment and occurred in blue collar or service occupations more often (Bouknight et al., 2006; Sanchez et al., 2004). In a systematic review of factors related to return to work, Taskila and Lindbohm (2007) found that those who worked in blue-collar jobs that involved a physical workload, especially heavy lifting, have less education and were more likely to terminate their work career. Bradley and Bednarek (2002) suggested that the extent of work limitations was affected by job type and workplace demands. Some survivors stated that cancer interfered with their ability to perform tasks that required lifting heavy objects or jobs that required them to keep up to pace with others.

In a study conducted by the Institute for Women's Policy research, investigators reported that paid sick leave policies can vary greatly between occupations (Lovell, 2004). Researchers reported that white-collar occupations including 73 percent of executive, administrative, and managerial, 71 percent of professional and technical, and 68 percent of administrative support and clerical occupations had paid sick leave benefits. In contrast, only one third to two fifths of blue collar occupations have paid sick leave although historically work policies for paid sick leave were more prevalent in highly unionized organizations. Today, utilities, state, and local government tend to have well developed paid sick leave policies (Lovell, 2004).

In a Department of Labor summary of employee benefits in private industry in the U.S., findings revealed that workers in large organizations were more likely to have access to leave benefits including paid sick leave, paid personal leave, and paid family leave (U.S. Department of Labor, 2007). Workers in large organizations were also more likely to have retirement benefits, healthcare, and disability benefits compared to those workers in small organizations. A third of large organizations with 100 or more workers offered a defined benefit plan for employees compared to only 10 percent of employers of smaller organizations.

Investigators documenting the return to work experiences of adults with various cancer diagnoses reported the presence of apprehension and anxiety about losing their job, fear of disappointing co-workers because of decreased productivity, perceived discrimination, physical workload, and increasing work pressure (Maunsell et al., 2004; P. Schultz et al., 2002; Spelton et al., 2003). Regardless of these concerns survivors who

returned to work stated that they returned to their prior job because of fears of losing health insurance, afraid to change jobs in case they got sick, financial reasons, and a reluctance to apply for a new job because of concerns relating to disclosure and illness (Hensley et al., 2005; Hewitt, Breen, & Devesa, 1999; Main et al., 2005; P. Schultz et al., 2002; D. E. Stewart et al., 2001). Survivors reported in one study that decisions regarding life choices were influenced by job and insurance related considerations because of a cancer diagnosis (Hounshell et al., 2001). Sabatino, Coates, Uhler, Alley, and Pollack (2006) reported the most common reasons for not having insurance resulted from losing or changing jobs, unaffordable health insurance costs, and working for employers who didn't offer insurance. Cancer survivors who were uninsured were more likely to report being uninsured because of lost medical care coverage than non-cancer controls (Sabatino et al., 2006).

Bradley et al. (2007) reported that survivor perception of their employers' willingness to accommodate was an important predictor of return to work in breast cancer patients. Although not common, the desire to return to work was voiced by some survivors who did not return because of being laid-off, being fired, quitting a job because of colleagues or supervisors, being advised by their physicians, or taking early retirement because of cancer (Bradley et al., 2005; Maunsell et al., 2004; Sanchez et al., 2004; D. E. Stewart et al., 2001).

An additional component within the realm of quality of life is the existence of support systems or workplace accommodation incorporated within the workplace. Fear of survivors regarding employer intolerance of illness intimidated survivors from disclosing

a cancer diagnosis to an employer has also been reported (D. E. Stewart et al., 2001). Job related problems in the form of discrimination were identified as threats that may affect future career prospects while employed in their current position (Maunsell et al., 2004; D. E. Stewart et al., 2001). Almost 49 percent of breast cancer survivors in one study reported that they did not disclose their cancer diagnosis to their boss or supervisor because of fear of creating job related problems (D. E. Stewart et al., 2001). Survivors cited negative employer beliefs as a reason for not returning to work which may have accounted for a return to work rate of 46 percent (Chen et al., 2006).

Work-Related Factors and Presenteeism

Employer related factors that influence participation in presenteeism may include work-time arrangement, attendance pressures, and organizational culture. In a study of mostly 884 blue collar union workers, predictors of sickness presenteeism were investigated. Bockerman and Laukkanen (2009b) found that if an employee is in poor health and desires to work fewer hours than required there is a higher prevalence of presenteeism; however for those employees in good health who work more than their desired hours there is a higher prevalence of absenteeism. This finding implies that by designing organizational policies that improve working time arrangements (e.g. matching actual hours worked with desired hours worked), there may be a reduction in both absenteeism and presenteeism in ill workers. Presenteeism has also been associated and predictive of absenteeism (Bergstrom et al., 2009).

Presenteeism estimates can vary by occupation. In a study investigating presenteeism in relation to occupation and organization, 3,801 employed persons in Sweden were

surveyed as to whether work was attended despite feeling that they should have not worked due to their health. Stratification by working sector indicated that women had higher presenteeism if they worked in sectors that provided care or welfare services or teaching. These sectors include nursing home aides, registered nurses, medical doctors, and pre-school teachers. The authors attributed this to the type of occupation that requires workers to be present to meet the needs of other people and it is often difficult to find a substitute to accomplish tasks. Sectors that were low paying in which the work environment was stressful and required physical stamina were also associated with presenteeism, although not as prevalent as caretaking or welfare services. Examples of those types of jobs included banking officials, storekeepers, cashiers, office clerks, and sales associates. For those individuals with fatigue and depression, researchers also found if their jobs were hard to replace there was a high incidence of presenteeism (Aronsson et al., 2000).

In a study of 12,542 employed and unemployed cancer survivors who were 11-27 years since diagnosis, those who worked in agriculture, forestry, fishery, transportation, communications and manufacturing were 18 to 20 percent less likely to be employed compared to matched controls. For those who worked in technical positions, social sciences, administrative, managerial, and clerical work there was no significant difference for being employed compared to matched controls (Taskila-Brandt et al., 2004).

Presenteeism estimates also vary by company size. Researchers in one study aimed to identify organizational perspectives on the return to work of cancer survivors. Two-

hundred and fifty-two surveys were administered to medium to large size companies to gather return to work policies and procedures (Grunfeld, Rixon, Eaton, & Cooper, 2008). Often these companies did not have a cancer specific return to work policy or the ability to provide statistics regarding the incidence of employee cancer rates. Grunfeld et al. (2008) suggest that even medium and large sized companies do not have the information necessary for developing adequate return to work policies that would enable survivors to continue to work and aid in maintaining a healthy workforce. The consequences of not providing workers with adequate sick policies may put workers at risk for being fired or suspended for being absent with the eventual loss of health insurance, financial instability, worse health outcomes, and greater demands on healthcare resources. An inability to take time off from work during illness can increase both absenteeism and presenteeism rates (Lovell, 2004).

Reductions in work force have also been implicated in the increased incidence of presenteeism. In environments where cutbacks are widespread there is an increased fear of job loss, increased workload, and organizational structures that provide greater visibility of individual work attendance patterns. Sectors where there were major personnel cutbacks also showed high rates of presenteeism. Consequently, increased presenteeism associated with these factors may compel those individuals who are sick to attend work despite ill health and long work hours without being productive (Johns, 2009).

Organizational Sick Pay Policy, Work Patterns, and Presenteeism

In a U.S. national public opinion poll, 77 percent of the participants rated paid sick days as a “very important” workplace right that should be a standard policy (T. W. Smith, 2008). The endorsement for paid sick day legislation as a basic worker right was supported across all socio-demographic and political majorities. Seventy-six to 82 percent of respondents agreed with the arguments that paid sick days would improve worker productivity and workers should not be in a position to lose a day’s wage due to illness in today’s economy (T. W. Smith, 2008). The United States currently does not have a national paid sick leave policy, yet 145 other countries around the world, both wealthy and poor, have instituted paid sick leave programs for every working citizen (A. Earle & Heymann, 2006; Munir, Yarker, & Haslam, 2008). Legislators who formulate national or workplace policies do so to protect and provide citizens who otherwise would not be provided employee benefits. In fact, inflexible absence policies may be increasing rates of presenteeism and impacting long- and short- term sickness absence (Munir et al., 2008).

One example of employer accommodation is the use of part-time sick leave policy that has been introduced in countries outside the United States, specifically Sweden, as a method to reduce absenteeism as well as to improve health outcomes in employees (Andren & Andren, 2009). Use of part time sick leave is a method to provide those who are ill an opportunity to return to work on an incremental schedule. This approach is intended to extend the recovery period and thereby provide those with chronic and acute conditions the benefit of recuperating gradually while maintaining contact with the

employer and increasing the probability of returning to pre-treatment levels. It has been reported by several investigators that the patterns of return to work and work productivity can be improved by employers who supported reduced work load or flexible working hours (Yarker et al., 2009). Bouknight et al. (2006) reported that breast cancer survivors one year from treatment found that there was a greater likelihood of return to work when survivors had sick leave and perceived their employer as accommodating to their illness and treatment needs. Organizational "sick pay policy" has been found to be associated with work patterns of the CRC survivor after treatment (Munir et al., 2008; Munir et al., 2009).

Taking advantage of paid sick pay is health promoting for both physical and psychological recovery from disease. A sense of belonging and the positive effects of co-worker camaraderie can facilitate an easier transition to return to work if return to work is gradual. Alternatively, long periods of work absence can make a more difficult transition back to work. Amir, Moran, Walsh, Iddenden, and Luker (2007) investigated colorectal cancer survivors 3 years after diagnosis. Those survivors who took sick leave for less than 6 months were more likely to work the same hours but for those who took sick leave for more than 18 months were more likely to work less hours due to illness and were more likely than those working the same hours to see their working lives deteriorate. Employer accommodation can create an environment that can reduce presenteeism and absenteeism (Aronsson & Gustafsson, 2005).

Taskila-Abrandt et al. (2005) suggest that among cancer survivors returning to work after a disabling illness is less likely to occur if financial support is provided by the

government such as providing social security for early retirement due to serious illness. It may enable survivors to take extended leaves that may not be necessary and prevent them from returning to work even if they are physically and psychologically able.

Conclusion

Based on the review of the literature and the identified gaps in knowledge, this study was designed to investigate the following aims of colorectal cancer survivors working at the time of diagnosis.

1. To describe changes in the work pattern of colorectal cancer survivors after treatment. Work patterns are defined as: (a) rates of return to work, (b) reasons associated with gaps in employment, and (c) temporary lapses in employment.
2. (a) To examine the relationship of individual variables (age, gender, race, marital status, education, depression, and HRQOL), disease variables (time since treatment, stage of disease, and treatment), and work variables (occupation, company size, health insurance status, and sick pay policy) to work patterns during and after treatment.

   (b) To examine the relationship of individual variables (age, gender, race, marital status, education, depression, and HRQOL), disease variables (time since treatment, stage of disease, and treatment), and work variables (occupation, company size, health insurance status, and sick pay use) to presenteeism among colorectal cancer survivors after treatment.

3. To examine the relationship of individual, disease, and work-related factors to the perceived adequacy of sick pay policy among colorectal cancer survivors after treatment.

CHAPTER THREE

METHODOLOGY

The purpose of this chapter is to present the methods used to conduct the study. The method for obtaining the sample and the methods used to collect and analyze the data will be described. Multiple statistical methods included descriptive statistics, survival analysis, and multiple and logistic regression analysis to test and describe the specific aims of this study.

Design

This research design was a retrospective survey. Participants were screened for eligibility based on a record review.

Sample

The study sample was recruited from the population of colorectal cancer (CRC) survivors treated in a large urban outpatient clinic of a comprehensive cancer center. Inclusion and exclusion criteria are listed here.

Inclusion Criteria

1. Individuals with a diagnosis of Stage I, II, III, IV colorectal cancer diagnosed between 2005 and 2011 and who had completed treatment ≥ 6 months and < 7 years to survey.
2. Individuals who were treated at a comprehensive cancer center in a New England state and who were employed (< 32 hours or ≥ 32 hours).

3. Individuals who were followed in the outpatient gastrointestinal clinic or referred by a clinician.

4. Individuals who were able to speak and read English.

5. Males and females aged 18 to 65 years at time of diagnosis.

Exclusion Criteria

1. Individuals who were younger than 18 years of age at time of diagnosis and older than 65 years of age at diagnosis.

2. Individuals who were unemployed at the time of diagnosis.

3. Individuals currently receiving treatment for any type of cancer.

4. Deceased at time of data collection. Verification was conducted using the Social Security Administration death index website or evidence of a recent clinical visit. (http://search.ancestry.com/search/db.aspx?dbid=3693&o_xid=21892&o_lid=21892)

Potentially eligible participants were identified by a query of an internal comprehensive cancer center Clinical Research Information System (CRIS) Database© that includes information obtained from patients who gave permission at the consult to be contacted for participation in future studies. The Institutional Review Board (IRB) approved "umbrella" protocol governing these data allows authorized researchers to perform secondary or prospective data analysis from a pre-selected sample. Clinical and demographic data, including employment status at the time of diagnosis, are included in the database. A waiver of documentation of informed consent to obtain patient names, telephone numbers, and mailing addresses was obtained from the IRB prior to contacting any potentially eligible individuals or patients.

Sampling encompassed two steps. The first step was a search to identify any patient who met the following criteria: colorectal cancer patient diagnosed between 2005 and 2011 and employed or on temporary medical leave at the time of diagnosis according to the patient information database (CRIS). Potentially, eligible patients could also be identified through referrals from direct-care medical and radiation oncologists as well as advanced practice nurses working in the institution's gastrointestinal clinic; however, no patients were referred.

The initial CRIS database query searched for patients employed for either ≥ 32 hours or < 32 hours per week (defined by the CRIS database as full-time and part-time, respectively), seeking employment, not younger than 18 years at time of diagnosis and ≤ 65 years at time of diagnosis. Patients who were retired, homemakers, or students at the time of diagnosis were excluded. Based on step one, a convenience sample (N=388) of potentially eligible patients treated most recently from 2005 to 2011 was identified from the database of the medical and radiation departments. The results of the initial database search are shown in Table 1. The purpose for selecting this range was to include patients covering up to a 7-year range from diagnosis to survey.

Table 1

Database Search Results for Potentially Eligible Subjects from 6/1/2005 to 6/30/2011

Employment Status at Diagnosis	**N**	**%**
Employed ≤ 32 hours	46	12
Employed > 32 hours	256	66
Medical Leave from a Job	86	22
Subtotal of Potentially Eligible Sample	**388**	**100**

In step 2, a mailed survey questionnaire packet was sent to each potentially eligible patient's home address. This questionnaire served the purpose of confirming eligibility (or identifying patients who were no longer eligible) as well as providing the actual data collection instrument for those patients who were eligible to participate. The flow of eligible through the screening process including reasons for non-participation is depicted in Figure 2.

Ninety-seven (n=97) participants were included in Aim 1, Aim 2a and Aim 3 analyses. Seventy-nine (79) were included and 18 were not included in Aim 2b analysis.

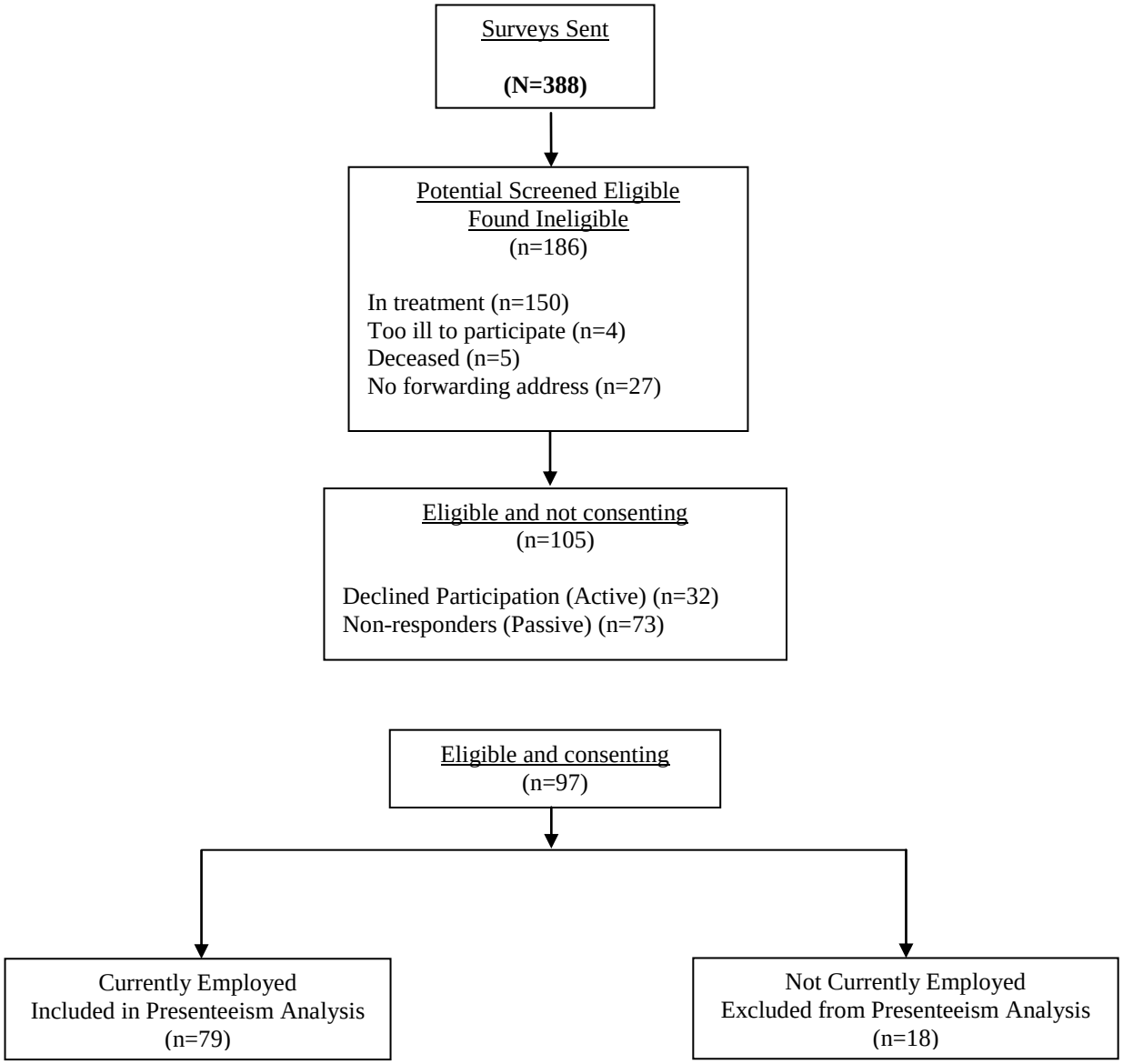


Figure 2. Flow Chart for Sample Selection.

Instruments

The measurement tools used in this study were either developed exclusively for this study or previously validated and obtained from external sources.

The Demographic, Employment Patterns and Sick Leave Benefits Questionnaire (DEPSLBQ) was used to measure self-reported individual, disease, and work-related factors (Appendix A). The DEPSLBQ was developed by the investigator explicitly for this study. Individual variables measured in the DEPSLBQ were age, gender, ethnicity, marital status and education. Disease-related variables were time since diagnosis, stage of disease, and treatment. Stage of disease was extracted from the medical record and added to the DEPSLBQ by the researcher. Work related variables collected were occupation, company size, health insurance status, adequate sick pay and sick pay used at diagnosis using the DEPSLBQ. Participants were also asked if the reasons for leaving employment were voluntary or involuntary as well as describing their work experiences. A checklist of reasons for voluntarily or involuntarily loss of employment was also provided that included detailed reasons such as because of health, recommended by physician, encouraged by employer, family, co-workers, or friends, fired or laid off, retired, or choosing to take advantage of other opportunities. In addition, a gap in employment was defined as the first episode of unemployment exclusive of temporary sick leave or disability. Participants were also asked if they believed they had adequate accommodations.

The final DEPSLBQ used in this study is based on a pilot-test. It was conducted to obtain feedback from adults similar to study participants about the clarity of questions

and response options, understanding of terminology, ease of recalling information, and time to complete the survey questionnaire. These are standard self-report survey evaluation criteria for pilot-testing using cognitive interview methods (Fowler, 2009). Cognitive interviewing refers to discussions with participants as to understanding of terms and comprehension of questions in the survey.

The cognitive Interview Guide/Data Collection Form was used to evaluate and refine the DEPSLBQ during the pilot study (Appendix B). A convenience sample was obtained by asking treating clinicians in the outpatient gastrointestinal clinic of the comprehensive cancer center for which the main study sample was recruited for referrals. Six CRC survivors diagnosed between 6 months and 6 years of completion of treatment were identified and participated in cognitive interviews. Interviewees ranged in age from 58 to 70 years of age and were diagnosed between 1999 and 2010. In addition to the other study materials, participants were given a Pre-test Introductory Cover Letter (See Appendix C) that contained an explanation of the purpose of the interview and the original version of the DEPSLBQ (Appendix D).

Questions were prepared to test comprehension of each survey question and the meaning of terms, memory recall of employment history, and the choice of responses in the scale. Four of the six participants experienced a gap in employment from diagnosis to survey. Time to complete the survey ranged from 7 to 10 minutes, and interviews took 15 minutes, on average.

Cognitive interview participants made several suggestions to clarify certain aspects of the DEPSLBQ items. For example, one suggested providing a more in-depth

description of occupation as well as including enrollment in the military as a service occupation. Participants also suggested addition of open-ended questions, an expansion on the types of accommodations employers provided, and the option for self-employed responders to answer questions regarding adequate “sick pay” or “accommodations” as they were often not applicable. Overall, the DEPSLBQ was evaluated positively, was easy to understand, was not regarded as too long or burdensome, and was regarded as noninvasive. Recommendations were added to an amended IRB protocol and approved.

The DEPSLBQ measured *rates of return to work* in this study defined as continued employment in the job held at time of diagnosis excluding temporary sick leave or disability (Sabatino et al., 2006), or otherwise (0) to time of survey. The first gap in employment during and after cancer treatment other than temporary sick leave or disability was defined as a termination of or lack of employment from the workplace. Improved treatment of chemotherapy side-effects and the increasing use of oral chemotherapy enable patients to continue to work during treatment (Kopec et al., 2007): therefore, participants who experienced temporary lapses in employment using sick pay, vacation or unpaid time off were considered remaining employed and were not considered to experience a gap in employment.

Reasons for *gaps in employment* were also collected using the DEPSLBQ. Both voluntary (yes=1; no=0) and involuntary (yes=1; no=0) reasons for leaving the workforce during and after cancer treatment have been reported including an inability to perform work duties, enforced by an employer, or early retirement (Spelton et al., 2002).

Temporary lapses in employment were also collected using the DEPSLBQ, defined as the number of sick days taken from diagnosis to end of treatment, paid (yes=1; no=0) and unpaid (yes=1; no=0).

The variable "perceived having adequate sick pay" has been associated with a greater likelihood of increased productivity in the workplace (Bergstrom et al., 2009; Bockerman & Laukkanen, 2009a). Survivors reported whether they perceived themselves as 1 = having or 0 = not having an adequate sick pay policy.

Some variables were dichotomized based on participants' responses to the DEPSLBQ items in preparation for the regression and logistic regression analyses. Dichotomized variables included gender (1= male, 0=female), education (1= ≥ college, 0 ≤ than college), marital status (1= married, 0 = not married), stage (1= ≥ 3, 0= ≤ 2), treatment (1= combined treatment, 0= surgery only), health Insurance (1= private, 0= other is other both public or no insurance), job type (1= professional, 0= trade, service or clerical), company size (1= ≥ 500, 0= < 500), and sick pay used during treatment (1= yes, 0= no).

A previously developed and validated questionnaire used in the analysis of presenteeism was The *Work Limitations Questionnaire* (WLQ). It is a 25-item self-report measure of work limitations (Lerner et al., 2004; Lerner & Amick, 2001; Lerner et al., 2003) was used to measure presenteeism (Appendix E). The empirical indicator for presenteeism was the productivity loss score, reported as percentage of productivity lost on the job. The average amount of time required to complete the WLQ is 5-10 minutes.

The WLQ is designed to assess the degree that health problems interfere with performance of specific job tasks in the prior two weeks and related decrements in at-work productivity. Items are rated on a 5-point Likert scale (1-5), with higher scores indicating more impaired work performance. The 25 specific job tasks mentioned in the WLQ items are combined into four "work limitation" scales: a 5-item Time Management scale that measures ability to manage time and scheduling demands; a 6-item Physical Tasks scale to measure the ability to perform job tasks that involve bodily strength, movement, endurance, coordination, and flexibility; a 9-item Mental-Interpersonal Tasks scale that measures the difficulty in performing cognitive job tasks and tasks involving interaction with others; and a 5-item Output Tasks scale that measures decrements in an ability to meet job demands for quantity, quality, and timeliness of work. Total scale scores range from 0 (limited none of the time) to 100 (limited all of the time). In addition, the WLQ scale scores are weighted and summed according to a validated algorithm used to generate a productivity score (Lerner et al., 2004). Time Management, Physical Tasks, Mental-Interpersonal Tasks, and Output Tasks scale scores were compared to healthy employee controls adjusting for gender, age, and education.

Following guidelines from Lerner, Rogers, & Chang, (2009), missing responses in the present study were handled using the half-scale rule. Scales are scored if half or more of the items have been answered in each domain. The "does not apply to my job" response or blank responses are considered and coded missing. For the purposes of the present study, item means for missing data were imputed if the participant responding completed at least 50% of the items.

The WLQ development process and psychometric performance are described in this section. Content validity of initial WLQ item sets was assessed by identifying relevant job and occupational demands from the scientific literature, using focus groups and cognitive interviews of employed chronically ill populations (respiratory, gastrointestinal, psychiatric and neurological diseases), and conducting a review of instrument items by a physician expert panel (Lerner et al., 2001). Construct validity was evaluated by comparing WLQ scale scores to those obtained from the SF-36 role/emotional and physical limitation scales; (WLQ scales were found to be significantly related to the SF-36 measures of physical and mental health). Reliability was measured for samples of patients with rheumatoid arthritis, chronic daily headache syndrome, or epilepsy; Cronbach's alpha internal consistency reliability coefficients for each of the four scales ranged from 0.88 to 0.91 (Lerner et al., 2001).

The WLQ has also been tested for criterion validity by comparing the WLQ to employee work productivity data from 1,827 survey responders of a large retail durable goods distributor in a large retail mail-order operation (Lerner et al., 2003). The findings of this study revealed that employee work productivity was significantly associated with three WLQ scales: Time ($p=0.003$), Physical ($p=0.001$), and Output ($p=0.006$). All four WLQ scales combined were significant ($p \leq 0.001$).

The WLQ has been used in studies of breast and brain cancer patients and survivors (Feuerstein, Hansen, et al., 2007; Hansen et al., 2008; Lavigne et al., 2008). Other chronic conditions for which the WLQ has been tested include rheumatoid arthritis

and osteoarthritis, depression, and anxiety and others (Lerner, Reed, Massarotti, Wester, & Burke, 2002; Sanderson et al., 2007; Wolfe, Michaud, Choi, & Williams, 2005).

In the present study, Cronbach's alpha was calculated to be 0.84 for the overall instrument, and 0.86, 0.67, 0.88, and 0.79 for the Time Management scale, Physical Tasks scale, Mental-Interpersonal Tasks scale, Output Tasks scale, respectively. The minimum acceptable reliability level for a multi-item scale is considered to be .70 (Nunnally & Bernstein, 1994).

The *European Organization for Research and Treatment of Cancer Quality of Life Questionnaire Version 3* (EORTC QLQ- C30 v3; Appendix F) is a 30-item questionnaire used to measure the quality of life of patients participating in cancer clinical trials (Aaronson et al., 1993). Health-related quality of life (HRQOL) was identified as an individual factor in the present study. The QLQ-C30 encompasses six multiple-item subscales -- physical functioning, role functioning, emotional functioning, cognitive functioning, social functioning, and global quality of life -- as well as nine symptoms -- fatigue, nausea/vomiting, pain, dyspnea, constipation, diarrhea, trouble sleeping, appetite loss, and financial impact (Aaronson et al., 1993). Items 1-28 are coded with four response categories: "1=Not at all", "2=A Little bit," "3=Quite a bit" and "4=Very much". The remaining two questions relate to overall health and quality of life, and are independently assessed using a 7-point Likert-type scale from 1 = very poor to 7 = excellent. The time required to complete the questionnaire is approximately 11 minutes.

The raw score for the QLQ-C30 is calculated by averaging across the items that contribute to the subscale or symptom, and all scores for the functioning

subscales and symptoms are linearly transformed to a 0 to 100 scale. Scores can be compared against reference values published in the EORTC QLQ-C30 manual, which include data from both cancer and general populations based on large random samples. (*http://groups.eortc.be/qol/downloads/modules/specimen_20qlq_c30.pdf*).

The Cronbach's alpha internal consistency reliability coefficient for the present study sample for the overall instrument was calculated to be 0.89, and 0.88, 0.92, 0.85, 0.93, and 0.85 for the physical, role, emotional, social, and cognitive functional subscales, respectively.

The Patient Health Questionnaire (PHQ-9), a brief 9-item depression assessment questionnaire, was used to measure depression, which was regarded as an individual factor in the present study (Appendix G).

Each item, describing a symptom of depression (e.g., "Little interest or pleasure in doing things"), is rated as occurring 0 = "not at all", 1 = "several days", 2 = "more than half the days", or 3 = "nearly every day". Total scores for all items are used to determine depression symptom severity; minimal (0-4), mild (5-9), moderate (10-14), moderately severe (15-19) or severe (20-27) (Kroenke & Spitzer, 2002). A raw score of 15 and above is considered a "red flag" indicating individuals for whom active treatment is probably warranted, and a score above 10 is regarded as a "yellow flag" indicating a potentially clinically significant condition. The presence of five or more of the nine depressive symptoms for at least "more than half the days" in the previous 2 weeks indicates possible major depression disorder. Other depressive disorder is diagnosed if the symptoms for questions two, three, or four

have been present at least “more than half the days” in the past 2 weeks. Question nine, “thoughts that you would be better off dead or of hurting yourself in some way” is considered significant if present at all. For the purposes of the present study, item means for missing data were imputed if the participant completed at least seven of the nine total scale items.

The PHQ-9 has been found to be a reliable and valid measure of depression severity. Strong relations between PHQ-9 scores and changes in functional status, disability days, and symptom-related difficulty have been reported as estimates of construct validity (Kroenke, Spitzer, & Williams, 2001). Reliability has similarly been confirmed, with Cronbach’s alphas of .86 to .89 reported in studies of primary care and OB/GYN patients (Kroenke et al., 2001). The Cronbach’s alpha for the study sample was 0.84.

Data Collection Procedures

Most of the data from this study were collected by mail questionnaire. These data were supplemented with chart review.

An informational packet sent to potential participants included an Introduction Letter (Appendix H), the questionnaires (DEPSLBQ, WLQ, EORTC QLQ-C-30, PHQ-9) and an opt-out post card and telephone script (Appendix I). Potentially eligible participants who were not employed at the time of data collection were instructed to complete only the DEPSLBQ, EORTC QLQ-C-30, PHQ-9) and employed participants were also asked to complete the WLQ. Failure to respond within two to four weeks elicited a follow-up telephone call as a reminder (explained

in the introductory letter). No more than three messages were left after an initial attempt to contact a potentially eligible participant by telephone.

Data Analysis

Data analysis began with the collection of survey data that was completed and finalized two months after mailings at which time all data was entered simultaneously after receipt of the surveys. Those eligible potential participants who did not respond were telephoned to be offered participation and interested a second mailing was sent. Questionnaires were included in the analysis if received within one month of second mailing.

Independent variables in this study included age, gender, marital status, education, treatment type, race, disease stage, HRQOL score, depression score, time since treatment, health insurance, occupation, company size, and sick pay use. The codebook for the variables is in Appendix J.

Quantitative data were coded and entered into a computer using both PASW® Statistics GradPack 18 and STATA®/1C 12.1 for Windows®. Frequency distributions and measures of central tendency and variability were calculated for all variables. Normality and equality of variances was assessed in the relevant continuous variables and normalizing transformations were considered where appropriate but were not used.

Prior to analyses, data cleaning was conducted as suggested by Van den Broeck, Argeseanu Cunningham, Eeckels, and Herbst (2005). Screening for outlier cases and variables was accomplished by reviewing summary statistics, cross-tabulations, and graphs of distributions using box plots, histograms, and scatter plots. The data file was

also examined for coding or transcription errors as well as for missing data. Outliers were not found to be extensive and were retained in the analysis, and erroneous data were corrected and missing data was followed-up with participants. Upon completion of data entry, a random audit was performed by two reviewers. Three minor errors were found in18 (18%) cases and were corrected. No errors were found in a review of an additional 5 (5%) cases.

Correlational matrices were constructed to check for multicollinearity among independent variables, which could compromise the rigor of the planned multiple regression analyses. The cut-off points for defining multicollinearity was a coefficient greater than 0.70. The Pearson r was used to measure the associations between interval variables, and point-biserial correlation was used to measure associations between dichotomous and continuous variables. Spearman's rho was used to measure associations between ordinal variables.

Tolerance was calculated as a measure of collinearity as well as a variance inflation factor (VIF) (Munro, 2004). Tolerance indicates how much of the variance of the independent variable is not explained by other independent variables. A tolerance of less than .20 and a variance inflation factor above 10 indicate multicollinearity. No variables were considered to reflect multicollinearity.

Correlation matrices also were constructed to examine the magnitude of correlations between each independent variable and each dependent variable to determine which independent variables would enter into the regression equations.

Aim 1

Describe changes in the work patterns of CRC survivors during and after treatment.

To describe changes in the work patterns of CRC survivors during and after treatment, descriptive statistics were used to summarize employment patterns as rates of return to work (by definition indicating the presence of a gap during or post-treatment employment), reasons associated with gaps in employment, and temporary lapses in employment (defined as paid or unpaid time off in the form of sick leave or vacation).

For the subset of participants who had a gap in employment, Kaplan-Meier (Rowland et al.) was performed to describe time to first unemployment.

The design of the present study met all criteria for KM analysis (Norusis, 2005). Study participants were a sample of CRC patients who were all employed at the time of diagnosis and who may experience unemployment as the terminal event of this study. The KM estimate is a straightforward way of computing survival in the labor market in spite of differences in the time that participants enter the study and differences in observation times of participants. KM makes allowances for observations in which an event does not occur, otherwise censored, by making use of information up to the time when an observation is censored or continuously employed. Two procedures of KM survival analysis were used to estimate the cumulative survival function at the time each event occurred: the survival function and the hazard function.

The survival function S(t) is the probability of working at least to time t. The hazard function, described as h(t), is the conditional probability (hazard probability) of working at least to that time. The hazard probability examines a gap in employment over

time occurring simultaneously with the risk of a gap in employment at each time period. The hazard probability, or cumulative hazard, on the y-axis is the conditional probability of a gap in work at a particular period, given that a participant was working in the previous period. This calculation was affected by the number of cases unemployed over number of cases employed at each interval. The list of hazard probabilities over time constitutes the hazard function.

In the KM analyses for this study, time was defined as the time from diagnosis to event if a gap occurred. Those participants who experienced a gap in employment were coded as “1” and those who did not experience a gap in employment were coded as “0”. The KM procedure was used to estimate and compare the survival curve from the observed survival times by creating an interval with lengths dependent on when gaps in employment occurred over the first 3 years of CRC survival.

The number and proportion of gaps in employment at 1 year intervals over 3 years were also described. Reasons associated with gaps in employment, temporary lapses such as use of sick pay, paid and unpaid sick pay, and accommodations provided by employers were listed and categorized.

Aim 2

(a) - Examine the relationship of individual-, disease-, and work-related factors to the work patterns of CRCs during and after treatment.

Logistic regression was used to examine the relationships of individual-, disease-, and work-related factors to gap in employment: gap = 1; no gap = 0. A two-tailed test of

significance was used due to an inability to predict the relation of variables to a gap in employment.

Aim 2(b) - Examine the relationship of individual-, disease-, and work-related factors to presenteeism of CRCs after treatment.

Hierarchical multiple regression was used to examine the relationships of work-related variables to the variable quantifying at-work productivity loss, controlling for certain individual- and disease- related variables; the multiple correlation coefficient, R^2, was examined to explain the amount of variance in productivity loss. Variables were entered in blocks of two, beginning with two individual variables, then work-related variables and disease-related variables. Standardized coefficients converted to the same scale were also compared, as well as evidence of a significant change in R^2. Two tailed hypothesis testing was conducted for a multiple regression because of the uncertainty of the positive or negative influence of each independent variable.

Aim 3

Examine the relationships of individual, disease, and work-related factors to an adequate sick pay policy of CRCs after treatment.

Logistic regression was used to examine the relationships of individual-, disease-, and work-related factors to perceptions of sick pay policy. According to Pearson correlations, two independent variables were significantly correlated with the outcome of adequate sick pay using two-tailed tests.

Protection of Human Subjects

The principal investigator's interactions with potentially eligible and eligible participants were restricted to study-related mailings and telephone calls. Study activities were conducted in strict confidentiality to protect each participant's privacy. Participant names did not appear on any instrument, and only an assigned identification number linked participants to names and addresses in the SPSS electronic database. IRB approval was obtained from both the comprehensive cancer center and the University of Massachusetts, Boston.

The study mailing included all of the necessary forms to establish eligibility, obtain consent, and obtain the study data, as well as an information sheet regarding physical and emotional health resources available to those who may become distressed while taking the survey (Appendix K). The information sheet included a note of thanks to participants for completing the survey, and provided contact information for organizations offering support for cancer survivors and those with depression. The information sheet also directed participants to crisis support lines or a local emergency room, and instructed them to call 911 for psychological emergencies. The information sheet was adapted from one used in several similar mailed questionnaire studies of emotional distress in cancer survivors at the comprehensive cancer center from which participants were recruited for the present study.

CHAPTER FOUR

RESULTS

The purpose of this chapter is to present the results of this study. The study sample is described and the results of Aims 1, 2, and 3 are reported and summarized at the end of the chapter.

Sample

The study sample included 97 CRC survivors ranging in age from 32 to 69 years (M=55.7 years, SD=8 years); age at time of diagnosis ranged from 31 to 65 years (M=52 years, SD=7.7 years). Men and women were nearly equally represented (men=48.5%). Time since diagnosis to survey ranged from 1 year to 6.8 years (M= 3.8 years, SD=1.8 years).

Seventy-three (75.2%) participants reported that at time of diagnosis they were employed in occupations classified as professional or managerial (e.g., engineer, computer programmer, professional sales, physician, nurse, teacher, or manager in manufacturing or construction). Eleven (11.3%) were in clerical or sales occupations (e.g., secretary, cashier, and shipping clerk); five (5.2%) were in service occupations (e.g., restaurant server, housekeeper, janitor, firefighter, and police officer); and two (2.1%) were in a trade (e.g., iron worker, electrician, plumber). The remaining six (6.2%) participants described themselves as self-employed (e.g., software and education consultant, sales, artist, proprietor). Slightly more than one-third (37.1%) worked

for companies with fewer than 500 employees and the majority had private health insurance (88.7%), reported having adequate sick pay (78%), had adequate access to accommodations (75%), and reported no change in work hours since diagnosis (58.8%).

The distribution of the sample with regard to time since diagnosis is given in Table 2. Slightly more than one-third (37%) of participants were CRC survivors from 1 year to 3 and one-half years since diagnosis.

Table 2

Survey Sample of Respondents' Time since Diagnosis

Time Since Diagnosis	Number of Respondents (n)	Percentage (%)	Cumulative Percentage (%)
≤1 – 2 years	21	21.7	21.7
2 – 3 years	15	15.5	37.2
3 – 4 years	18	18.5	55.7
4 – 5 years	16	16.5	72.2
5 – 6 years	10	10.3	82.5
6 years – 6 years, 6 months	17	17.5	100
Total	97	100.0	

Aim 1

Specific Aim 1 To describe changes in work patterns of colorectal cancer survivors during and after treatment.

At the time of diagnosis, 86.6% (n=84) participants were employed full-time, and 13.4% (n=13) were working part-time. At the time of data collection, 81% (n=79) of participants were working, and 19% (n=18) were not working. At the time of data

collection 62 (78.5%) of the 79 working participants were employed full-time and 17 (21.5%) part-time (Table 3). At the time of data collection the remaining participants were unemployed (16.5%) or retired (2.1%). The mean time since treatment for individuals working at the time of data collection was 3.0 years, and the mean time since treatment for those not working at the time of data collection was 3.2 years, which was not statistically significantly different.

Of the total sample, 39.2% (n=38) reported that they had reduced their work hours since diagnosis; 2% (n=2) reported an increase in work hours, and 58.8% (n=57) reported no change in hours since diagnosis. For those participants who were working full-time (n=84) at time of diagnosis, 41.7% (n=35) reduced their hours and 58.3% (n=49) did not change their hours since diagnosis. Changes in hours since diagnosis for part-time workers are also reported in Table 3.

The unemployment rate in this sample of CRC survivors was 18.6% (n=18). This rate included two individuals who were retired at the ages of 63 and 66 years at the time of data collection.

Table 3

Work Status at Diagnosis and Time of Survey Data Collection (N=97)

Work Characteristics	N	%
Full-time at diagnosis (≥32 hours)	84	86.6
Reduced hours	35	41.7
No change in hours	49	58.3
Part-time at diagnosis (<32 hours)	13	13.4
Reduced hours	3	23.1
Increased hours	2	15.4
No change in hours	8	61.5
Working status at time of data collection		
Full-time	62	63.9
Part-time	17	17.5
Unemployed	16	16.5
Retired*	2	2.1

Footnote: * A total of four participants initially reported the reason for a gap in employment was due to retirement; three of the four participants subsequently reported that they were unemployed.

There was a total of 33 gaps, most of which occurred by the third year after diagnosis (n=27 of a total of 33 gaps). As seen in Table 4a, 20 participants experienced a gap in employment within the first year, two experienced gaps in the second year, and five experienced gaps in the third year since diagnosis. The greatest frequency of gaps in employment (n=17) occurred within 6 months of diagnosis. Fewer gaps occurred in each subsequent interval. A total of 27 respondents had gaps in employment by 3 years since diagnosis. Therefore, all further analyses relating to a “gap in employment” were limited to up to 3 years since diagnosis due to the lack of variability in this outcome after this point in time. Table 4a includes gaps after 3 years. Kaplan Meier Survival Analysis revealed the probability of not experiencing a gap in employment at year 3 or having

continuous employment at least until year 3 post-diagnosis was 72.2% (Table 4b). Given the probability of not experiencing a gap in employment during year 1 was 79.4%, there was an increase of 7.2% from diagnosis to year 3 of experiencing a gap in employment. The mean time for the first gap in employment to occur was estimated to be 8 months, and the median time to a gap in employment was 3 months. A visual display of Kaplan Meier Analysis using the Survival and Hazard Function from 1 year up to 3 years as well as the probability of survival from 6 months to 6 years since diagnosis is presented in Appendix L.

Table 4a

Number of Gaps Occurring at 1 Year Intervals over 6 Years*

Time (Yearly)	Number of gaps	Number working prior (n)
0-1	20	97
1-2	2	77
2-3	5	75
3-4	3	70
4-5	2	67
5-6	1	64

Footnote:* The first gap in employment during and after cancer treatment other than temporary sick leave or disability was defined as a termination of employment from the workplace.

Table 4b

Probability of Survival from 6 Months to Year 3 since Diagnosis of Cancer using Kaplan-Meier Survival Analysis

Time (Yearly)	Number of gaps* (d)	Number working prior (n)	Proportion experiencing a gap (d/n)	Proportion working (1-d/n)	Cumulative survival probability (c) (1-d/n)*c
0-1	20	97	.206	.794	.794
1-2	2	77	.026	.974	(.794*.974) .773
2-3	5	75	.067	.933	(.773*.933) .722

*Footnote:** The first gap in employment during and after cancer treatment other than temporary sick leave or disability was defined as a termination of employment from the workplace.

The reasons participants left employment are listed in Table 5a. Of the 27 participants who had a gap in employment during the first 3 years, 20 (74%) left their job voluntarily and 7 (26%) left their job involuntarily. Participants leaving voluntarily most frequently cited health reasons as the most often cause (n=14, 70%). For example, a 48-year-old single mother of two reported that she had always worked two jobs but had to leave her positions as a teacher and a waitress because she was too fatigued to work the same schedule. Two (29%) left their jobs involuntarily because it was enforced by their employer (both of whom attributed their job loss to cancer). For example, a 56-year-old male distribution manager wrote a lengthy letter to the investigator sharing his disappointment when informed that his job was eliminated due to restructuring. He stated that he left involuntarily and then added that five other employees with cancer had the same experience. Other reasons given for leaving involuntarily included health (n=2), retirement (n=1), and inability to search for work reported by one self-employed participant. Voluntarily and involuntarily retired participants were between the ages of 66 and 69 years old.

Of the 27 participants who reported a gap in employment during the first 3 years, most 14 (51.8%) did not return to work after a gap and13 (48.2%) subsequently returned to work. Time until return to work varied; eight (61.5%) returned less than 1 year after experiencing a gap, four returned within 2 years of experiencing a gap, and one participant returned 3 years and 3 months after experiencing a gap in employment. Of the 13 participants who returned to work after a gap, the duration from loss of employment ranged from approximately 3 months to 39 months (M=11.6 months = SD 9.4).

Table 5a

Reasons for Gaps in Employment

Reasons for Gap	From Diagnosis to 1 year	1-2 years	2-3 years	Total
VOLUNTARY				**N (%)**
Because of health	11		3	14
Unable to perform job duties	2	-	1	3
Retired	1	-	1	2
Early retirement	-	1	-	1
Total Voluntary	**14**	**1**	**5**	**20 (74)**
INVOLUNTARY				
Because of health	2	-	-	2
Enforced by employer	2	-	-	2
Fired/laid off due to cancer	-	1	-	1
Retired	1	-	-	1
Other	1	-	-	1
Total Involuntary	**6**	**1**	**-**	**7 (26)**
Total annual	**20**	**2**	**5**	
Cumulative				**27 (100)**

Table 5b includes the demographic and work characteristics of those who experienced an employment gap within the first 3 years of diagnosis. Most were female (74%) and slightly less than half (49%) were employed at the time of data collection although mean age was between 56-57 years, which is well below the typical retirement

age. The majority (81%) of those who experienced a gap in employment used unpaid sick leave during treatment.

Comparing those who experienced a gap in employment to those who did not, revealed some differences in their work situations. Among the former, only 37% were allowed to work from home or had flexible work hours compared to 64% of the latter. Participants also shared personal stories about their employment experiences. In particular, some participants chose to discontinue employment even when offered flexible hours. A 61-year-old male truck driver and retired firefighter was able to work flexible hours around his treatments but nonetheless voluntarily left his employment about 1 month after starting treatment because of his health. He eventually returned about 6 months later. A 53-year-old male executive vice president reported that although he was offered a flexible work schedule he thought that his job performance was compromised because of cognitive side effects related to pain medications that ultimately impacted his continued employment. Self-employed participants had a different set of challenges. A 58-year-old self-employed metal worker explained that she went out of business; another self-employed 49-year-old proprietor closed her business because she had difficulty with physical duties.

Of the 97 participants, 14 (14.4%) reported use of sick days after diagnosis. The number of paid sick days used during treatment ranged from 1-220 days, with a mean of 39.4 days and a median of 22.5 days. The number of unpaid sick days used during treatment ranged from 1-150 days, with a mean of 24.8 days and a median of 5.5 days. Of those participants who responded to the question of whether they had adequate sick pay

(n=63), 93% of full-time workers reported that they had adequate sick pay compared to 80% of part-time workers who reported that they had adequate sick pay.

Table 5b

Characteristics of Participants Who Experienced a Gap in Employment Over 3 Years Since Diagnosis* (n=27)

Characteristic	**Voluntary Gap N=20**	**Involuntary Gap N=7**	**Total (n, %)**
Age at Time of Data Collection: M (SD)	57 (7.9)	56 (9.4)	
Gender			
Male	5	2	7 (26)
Female	15	5	20 (74)
Employment Status at Diagnosis			
Full-time	16	7	23 (85)
Part-time	4	-	4 (15)
Time Taken During Treatment (paid or unpaid)			
Paid Time off	4	1	5 (19)
Unpaid Time off	18	4	22 (81)
Change in Work Hours from Diagnosis to Time of Survey			
Decreased work hours	14	5	19 (70)
Increased work hours	1	-	1 (4)
No change in work hours	5	2	7 (26)
Employment Status at Time of Survey			
Full-time	5	3	8 (30)
Part-time	4	1	5 (19)
Unemployed	9	3	12 (44)
Retired**	2	-	2 (7)
Returned to work Since Employment Gap			
Yes	9	4	13 (48)
No	11	3	14 (52)

Footnote: *The first gap in employment during and after cancer treatment other than temporary sick leave or disability was defined as a termination of employment from the workplace. ** A total of four participants initially reported reasons for a gap in employment was due to retirement, three of the four participants subsequently reported that they were unemployed.

Table 6 displays 96 participants who responded to whether they had adequate accommodations at the time of their employment. As shown, 53 (55%) reported having adequate accommodations and 18 (19%) reported they had inadequate accommodations. For those participants who reported inadequate accommodations, 16 (89%) remained on the job and 2 (11%) left their employment. For 25 (26%) participants, accommodations were not applicable to their job.

Table 6

Perceptions of Adequate Accommodations at Diagnosis (n=96)

Working at Time of Data Collection	**Adequate Accommodations at Time of Diagnosis**	**Inadequate Accommodations at Time of Diagnosis**	**Not Applicable to Job**	**Total Working**
Yes	43	16	19	78
No	10	2	6	18
Total	53	18	25	96

For the 27 participants who reported a gap in employment in this sample, 15 (56%) reported they had received adequate accommodations, 2 (7%) reported inadequate accommodations, and 10 (37%) reported that receiving accommodations was not applicable to their job.

In summary, all 97 participants were working at time of diagnosis. A total of 27 participants had a gap in employment within 3 years. Of the 20 participants who experienced a gap in employment within the first year of diagnosis, 15 (75%) experienced a gap at the time of diagnosis: 4 (20%), during treatment; and 1 (5%), after

treatment was completed. During treatment, 78 participants continued to work, although 24 of these participants reduced hours of employment, 53 had no change of hours and one part-time worker increased hours.

Aim 2

Specific Aim 2 (a) Examine the relationship of individual-, disease-, and work-related factors to the work patterns of the colorectal cancer survivor during and after treatment.

The analyses for Aim 2(a) were based on the total sample (N = 97). Descriptive statistics for individual-related factors (age, gender, ethnicity, marital status, HRQOL, and depression), disease-related factors (time since diagnosis, stage of disease, and treatment) are found in Table 7. Analysis of race and ethnicity revealed no variability; therefore, these two individual-factor variables were excluded from further analysis.

Table 7

Individual-Related and Disease-Related Factors for the Sample (N=97)

	M	SD	Range
Time since diagnosis (years)	3.8	1.8	1-6.8
Age (Years) at Diagnosis	52	7.7	31-65
HRQOL*	83.3	16.1	25-100
Depression*	3.22	4.13	0-22
		N	%
Gender			
Male		47	48.5
Race			
White, Non-Hispanic		97	100
Marital Status			
Married or living with a partner		74	76.3
Not currently married		23	23.7
Education			
Less than college degree		33	34
College graduate or advanced degree		64	66
Stage of Disease**			
Early		50	52
Late		47	48
Treatment			
Chemotherapy/Surgery/Radiation		27	27.8
Chemotherapy/Surgery		47	48.5

*Footnotes:** HRQOL and depression were measured using the QLQ-C-30 and the PHQ-9. **Early stage disease was Stage I and II; Late stage disease was Stage III and IV.

Work-related factors (occupation, company size, health insurance status, and sick pay used at diagnosis) are shown in Table 8.

Table 8

Work-Related Factors of the Sample (N=97)

Occupation Type at Diagnosis	N	%
Professional, Managerial	73	75.3
Clerical/Sales	11	11.3
Service	5	5.2
Trade	2	2.1
Other	6	6.2
Company Size at Diagnosis		
Fewer than 11	20	20.6
11-50 employees	11	11.3
51-100 employees	11	11.3
101-500 employees	19	19.6
500 or more employees	36	37.1
Insurance at Diagnosis		
Private Health Insurance	86	88.7
Medicare	3	3.1
Government	7	7.2
Self-pay	1	1
Adequate Accommodations*		
Yes	53	75
No	18	25

*Missing data at random (MAR) or not applicable (n=6).

Global health status, which is part of the instrument used to measure HRQOL (EORTC QLQ-C30 v3), with scores that could range from 0-100, was calculated by

summing Likert scale values (range = 1 [very poor] to 7 [excellent]) for two questions: "overall health" and "overall quality of life." Reported global health status scores for the study sample ranged from 25-100 (M=83; SD=16). The interpretation of scores was accomplished by comparing scores of participants in this study against published data of reference values. Five of the nine symptoms that were included in the EORTC QLQ-C30 v3 were found to be statistically significantly better scores compared to referents (CRC patients in clinical trials): fatigue, nausea/vomiting, pain, dyspnea and appetite loss. Four of five domains in HRQOL were statistically significantly better compared to referents (CRC patients in clinical trials): physical, emotional, social, and role (Appendix M). In addition, participants in this study reported less insomnia, constipation and diarrhea compared to referents (CRC patients in clinical trials).

Among the 96 subjects with complete data for the measure of depression (PHQ-9), mean total raw scores ranged from 0-22 (M=3.2, SD=4.1). With regard to severity (data reported for all 96 subjects), 70 (72.9%) were designated as suffering minimal depressive symptoms, 18 as mild, 4 as moderate, 3 as moderate to severe, and 1 as severe. Two (2%) of participants scored in the category of a major depressive disorder and three (3%) scored in the category of other depressive disorder.

Inspection of the correlation matrix (Appendix N) for all study variables excluding race and ethnicity revealed no evidence of multicollinearity between independent variables. Therefore, all independent variables were potentially appropriate to include in both the logistic regression and the hierarchical multiple regression excluding race and ethnicity.

A logistic regression was conducted to explain a gap in employment (Table 9a). Gaps in employment were scored as 1, and no gaps, as 0. For those participants who had survived beyond 3 years, any actual gaps in employment were scored as 0= no gaps. Further inspection of the correlation matrix indicated that only three individual-related factors (education, QOL, and depression), one work-related (occupation), and no disease-related factors were statistically significantly correlated with gaps in employment. Thus, a gap in employment was regressed on education, quality of life, depression, and occupation. Race and ethnicity were not included in the analysis. A test of the full model against a constant only model was statistically significant (X^2= 15.814, N=97, df=4, p=.003), Nagelkerke's R^2 = .218, indicating that the set of four variables explained 21.8% of the variance in a gap in employment. However, the Wald criterion indicated that only education made a significant contribution (p=.048). Those with less than a college education were significantly more likely to experience a gap in employment. No other variables were found to be significant in the model. The EXP (B) value indicates that for individuals with a college education or post-graduate degree have an odds ratio of .346, which is associated with a 65.4% (1-.346) decrease in the odds of experiencing a gap in employment compared to those who do not have a college education.

Table 9a

Summary of Logistic Regression Analysis Explaining Employment Gap

Variable	*B*	*SE*	*OR*	95% CI	Wald Statistic	*P*
Education**	-1.061	.536	.346	[0.121, 0.989]	3.92	.048
Depression*	.145	.081	1.156	[0.986, .1.354]	3.20	.074
HRQOL*	-.006	.020	.994	[0.955, 1.034]	0.10	.756
Occupation**	-.687	.583	.503	[0.160, 1.577]	1.39	.239

Footnote: CI = confidence interval for odds ratio (OR).
*HRQOL and depression were measured using the QLQ-C-30 and the PHQ-9. **Education and occupation were measured using the DEPSLBQ.

A gap in employment was then regressed on education alone (Table 9b). The EXP (B) value for individuals with a college education or post-graduate degree have an odds ratio .277 which is associated with a 72.3% (1-.227) decrease in the odds of experiencing a gap in employment compared to those who do not have a college education. A test of the full model against a constant only model was statistically significant (X^2= 7.485, N=97, df=4, p=.006), Nagelkerke's R^2 = .107, indicating that education alone explained 10.7% of the variance in a gap in employment.

Table 9b

Summary of Logistic Regression Analysis for the Relation Between Education and Employment Gap

Variable	*B*	*SE*	*OR*	95% CI	Wald Statistic	*P*
Education	-1.284	.474	.277	[0.109, .701]	7.335	.006

Note. CI = confidence interval for odds ratio (OR).

Aim 2(b) Examine the relation of individual-, disease-, and work-related factors to presenteeism of the colorectal cancer survivor after treatment.

The results for work limitations are shown in Table 10. A total of 79 participants were working at the time of data collection and, therefore, completed the WLQ survey. The half-scale rule was used for four participants who did not have complete data for the calculation of productivity loss. Two participants report "does not apply to my job" in the Physical Tasks scale, and two participants did not answer an adequate number of questions in either the Time Management or Mental-Interpersonal Tasks scale leaving complete data for 75 participants. There were six instances of outliers in productivity loss scores (Appendix O). Outlier scores ranged from 11% to 15%. Most outlier scores were reported by participants who were female (*n*=4), married (*n*=5), at least college-educated (*n*=5), and received combined modality treatment (*n*=5). Outliers did not bias the data and were kept in the analysis.

Participants were compared with norms in the general working population on gender, race, and education for each subscale (physical, time management,

mental/interpersonal, and output scales) as well as the WLQ productivity loss scale. Only one significant difference was identified: limitations in performing physical work tasks were significantly greater for the study sample compared to comparison group (p=.020).

Table 10

WLQ Scores of Productivity Loss and Physical, Time Management, Mental Interpersonal, and Output Scale Domains (n=79*)

Instrument	Observations	Mean	Minimum	Maximum	Standard Deviation	Cronbach's alpha	Population Matched Control Mean	T-Tests for Matched Controls
Percent Productivity Loss Score (Presenteeism)	75*	2.68	0	15	3.6	.87	2.1	p=.162
Physical Scale	77	6.18	0	45.0	10.3	.67	9.1	p=.015
Time Management Scale	78	10.49	0	90.0	19.7	.86	7.6	p=.198
Mental Interpersonal Scale	78	7.83	0	52.8	12.0	.88	6.0	p=.182
Output Scale	79	8.47	0	62.5	15.1	.79	6.8	p=.331

*Four occurrences of missing data

Footnote: Scale scores range from 0 (limited none of the time) to 100 (limited all of the time in the prior 2 weeks).

A hierarchical multiple regression analysis was conducted to examine the relation of individual-, disease-, and work-related factors to presenteeism using the WLQ score (Appendix P). Data from 75 participants were available for the analysis. Preliminary analyses revealed no violations of the assumptions of normality, linearity, multicollinearity, or homoscedasticity for regression. Together, 10 independent variables accounted for 34% of the variance in presenteeism (p=.002). However, only three variables were statistically significantly related to presenteeism: insurance status (beta = .24, p = .026), HRQOL (beta = -.32, p = .011) and depression (beta = .29, p=.020) and accounted for 34% of the variance (Table 11). In summary, the final regression revealed that those with private insurance, poorer quality of life, and increased depression experienced increased presenteeism in the workplace.

Table 11

Results for Hierarchical Multiple Regression of Presenteeism on Insurance Status, Quality of Life, and Depression (n= 75)

Independent Variables	Unstandardized Coefficients		Standardized Coefficient	T	P-value	R-square	R-square Change F-Change	P-value for R-square change	Tolerance	VIF
	B	Standard Error	Beta							
Overall Model					.002	.34	.24	<.0001		
Constant	.059	.033								
Gender (Male =1)	-.002	.009	-.032	-.27	.79				.73	1.38
Marital Status (Married =1)	.008	.010	.099	-.84	.41				.75	1.34
Education (≥ College=1)	.009	.009	.108	.97	.33				.86	1.17
Occupation (Professional=1)	-.013	.010	-.153	-1.34	.18				.81	1.23
Company Size (≥500=1)	-.003	.008	-.041	-.38	.70				.92	1.09
Insurance (Private=1)	.027	.012	.239	2.28	.03				.96	1.04
Stage (≥3=1)	-.007	.009	-.102	-.82	.42				.68	1.47
Treatment (All = 1)	.020	.011	.228	1.90	.06				.73	1.37
Quality of Life	.001	.000	-.319	-2.61	.01				.70	1.42
Depression	.003	.001	.285	2.38	.02				.73	1.37

Aim 3

Aim 3 - Examine the relation of individual-, disease-, and work-related factors to adequate sick pay policy of the colorectal cancer survivor after treatment.

Frequencies of participants who reported having an adequate sick pay policy at the time of diagnosis are reported in Table 12. Six participants were self-employed (sick pay policy was coded as not applicable); the remaining three participants did not complete the item.

Table 12

Participant Response Frequencies to Perceiving Having Adequate Sick Pay at Time of Diagnosis (n=88)

Variable	n	%
Adequate Sick Pay*		
Yes	69	78
No	19	22

*Missing data at random (MAR) or not applicable (n=6)

A logistic regression was conducted to explain perceptions of an adequate sick pay policy (Table 13). The dependent variable was coded as 0 for perception of an inadequate sick pay policy and 1 for perception of an adequate sick pay policy. Inspection of the correlation matrix indicated that only one disease-related factor (stage of disease) and one work-related factor (occupation) were statistically significantly correlated with perception of adequate sick pay policy. Thus, perception of an adequate sick pay policy was regressed on stage of disease and occupation which were entered into the regression simultaneously.

A test of the full model against a constant only model was statistically significant, indicating that the two variables as a set distinguished between those who perceived having an adequate sick pay policy and those who did not (X^2 = 8.792, N=88, df=2, p<.012), Nagelkerke's R^2 of .147). Only14.7% of the variance in perception of having an adequate sick pay policy was explained by stage of disease and occupation. The Wald criterion supported the results for occupation (p=.04) and stage of disease (p=.050). Those in professional occupations (professional occupations = 1) and had early stage disease (early stage = 0) were significantly more likely to perceive having an adequate sick pay policy. The EXP (B) value indicates that for individuals in professional positions compared to those in service or trade occupations have an odds ratio of 3.281 associated with increased odds of perceiving an adequate sick pay policy. For those participants with late stage disease (late stage disease =1), the odds ratio or EXP (B) value indicates that for individuals with late stage disease have an odds ratio of .330, which is associated with a (1-.330) 67% decrease in the odds of perceiving having an adequate sick pay policy at diagnosis.

Table 13

Results of Logistic Regression Analysis for Perception of Adequate Sick Pay

Variable	*B*	*SE*	*OR*	95% CI	Wald Statistic	*P*
Occupation	1.188	.580	3.281	1.053-10.227	4.198	.040
Disease Stage	-1.109	.565	0.330	.109-998	3.855	.050

Summary of Study Findings

In summary, the findings of this study were:

1. The majority of gaps in employment (n=20) occurred within the first year of diagnosis. The probability of not experiencing a gap in employment in year 1 was 79.4% compared to 72.2% at year 3, a 7.2% increased chance of experiencing a gap in employment.
2. Gaps in employment that occurred within the first year of diagnosis included: 15 (75%) at the time of diagnosis, 4 (20%) during treatment, and 1 (5%) after treatment was completed.
3. Almost 75% of the participants in this study who experienced a gap in employment left voluntarily.
4. Fewer than half of those who experienced a first gap in employment returned to work.
5. The unemployment rate at the time of survey was 18.6%.
6. More than half of the participants in this study reported having adequate accommodations and almost one-fifth reported they had inadequate accommodations. Interestingly, one-quarter did not find accommodations relevant to their job.
7. Eighteen participants reported that they had inadequate accommodations yet, most 89% (n=16) remained employed and only two 11% (n=2) experienced a gap in employment.

8. Overall, participants in this study reported “good” quality of life and most participants had minimal depressive symptoms. Only 8% of this sample was designated as having moderate to severe depression.
9. Education was the only variable found to contribute significantly (OR = 0.346, p=.006) to the explanation for a gap in employment.
10. Participants in this study scored significantly lower than healthy individuals on the WLQ physical scale.
11. Insurance (p=0.03), quality of life (p=0.01), and depression (p=0.02) significantly contributed to the explanation of the work limitations score, such that private insurance (compared to government, self-pay, or none) a poorer quality of life, and greater severity of depression were associated with increased presenteeism.
12. Stage of disease (OR = 0.330, p=.050) and occupation (OR = 3.281, p=.040) significantly contributed to perceptions of having adequate sick pay.
13. Many of the variables in the theoretical model were not significantly related to work patterns, sick pay policy or presenteeism.

CHAPTER FIVE

DISCUSSION

This study was designed to examine the relationship of individual-disease-and work-related factors to changes in work patterns, presenteeism, and organizational sick pay policy of CRC survivors. The CMNHP (Fawcett & Russell, 2001; Russell & Fawcett, 2005) and the "Pathways to Work Life Recovery" (Spelton et al., 2002) were useful guides for the study by operationalizing and identifying the variables for analysis.

The study findings are encouraging compared to prior studies investigating factors influencing work patterns, presenteeism, and access to sick pay. Unlike prior study findings, the findings of this study suggest that the overall quality of life was not greatly diminished for this sample of CRC survivors. Furthermore, few occurrences of clinical depression appeared in this sample. The finding that education was related to a gap in employment, such that participants with a greater number of years of education had fewer gaps in employment is consistent with the findings of other studies.

Additionally, this sample of CRC survivors had overall better work productivity than matched controls. Poorer quality of life, greater depression, and access to private health insurance were significantly associated with presenteeism in the workplace. Furthermore, occupation and disease stage significantly contributed to the perception of having an adequate sick pay policy at diagnosis. However, contrary to expectations based on the literature, many individual-, disease-, and work-related factors were not found to

contribute to the explanation of gaps in employment, presenteeism, and perception of an adequate sick pay policy.

It is important to address the lack of significant independent variables affecting a gap in employment and presenteeism in this correlational study. Individual (age, gender, race, and marital status), disease (time since diagnosis, treatment, and stage) and work-related factors (company size, health insurance and sick pay use) were not associated with work patterns. Overall, the findings provide much more parsimonious explanations than those reported in previous studies. Several of these factors may be associated with work patterns, but the analysis of employment gap data did not extend beyond 3 years. It is also possible that other factors not included in this study (e.g., adequate accommodations, differences in union and non-union organizations) may have had a greater impact on employment patterns and presenteeism than the factors included in this study. As previously mentioned, the employee demand for the more traditional compensation packages (e.g., health insurance, sick pay) is not as enticing to potential employees in the current labor market. There has been a shift in demand of potential employees who are more likely to seek accommodations that include flexible work schedules or shortened work weeks (Ciampa & Chernesky, 2013). Additionally, the availability of accommodations may not be associated with the size of the company. Although larger companies are more likely to provide retirement, healthcare, and disability benefits, there continues to be a lack of return to work policies that include flexible work schedules or other accommodations (U.S. Department of Labor, 2007). In a national study of employers, Bond, Galinksy, and Sakai, (2008) suggested that smaller companies provide as much if not more flexibility in accommodating employee work

schedules compared to larger companies. Indeed, it may be easier for managers to interact and monitor worker productivity in smaller companies.

Changes in the Work Pattern of the Colorectal Cancer Survivor

The findings of this study add to the literature by exploring the frequency of gaps in employment, the reasons for leaving employment, the subsequent return to work after a gap, and the use of sick days used by CRC survivors after diagnosis.

The rationale for using survival analysis in this study was to better understand employment patterns of the CRC survivor and to estimate when providers should conduct a comprehensive assessment of patients and develop a plan of care for maintaining workplace retention. For the purposes of this study, return to work was defined as "continued employment in the workforce" exclusive of paid or unpaid sick leave and/or temporary disability and medical leave which was the terminal event used in the survival analysis.

The results of the present study reveal that the greatest likelihood of an employment gap for the CRC survivor occurred within the first 6 months since diagnosis. The frequency of employment gaps continued to occur after 6 months but at substantially lower rates. This finding was consistent with a longitudinal study of 800 employed breast and prostate cancer patients (Bradley et al., 2007). Similarly, in a cross-sectional study by Australian researchers investigating CRC survivors (N=975), most declines in work participation occurred within 6 months of diagnosis (Gordon et al., 2008). Gordon et al. (2008) reported that 54% (n=531) of 975 survivors were working by the end of year one. Although both studies indicated that the greatest decline in employment occurred within the first year of diagnosis, there was a 14% higher rate of employment in the current

study of CRC survivors. This contrast in the rate of employment at 1 year may be attributed to the differences in participant ages between the two studies. Gordon et al. (2008) reported that over one-third of the CRC survivor participants in the study were over 65 years old (M=60.2 years). Reasons for leaving the workforce were not reported, although older age is associated with retirement inclusive of those with cancer (Mehnert, 2010). In this current study, age was not associated with continued employment likely due to the study eligibility requirements limiting age to those less than 65 years (M=52 years, SD=7.7). Indeed, only two participants left employment to retire in the current study.

The findings of the current study revealed that 8 (30%) of the 27 participants who did return to work after experiencing a gap in employment did so within 1 year of leaving employment. Four (15%) participants returned to work by year two, one by year 3 (4%) and 14 (51%) did not return to work. This finding reveals the importance of measuring work patterns at short intervals. To date, researchers investigating "return to work" of cancer survivors have used cross-sectional study designs that do not include interim employment status from short to prolonged periods of time. Foster, Wright, Hopkinson, and Roffe (2009) reported that there was a lack of longitudinal designs that included interval employment data over time. Therefore, this has resulted in considerable variations of employment rates. This was reiterated by several other researchers (Grunfeld, Low, & Cooper, 2010; Gudbergsson et al., 2008; Maunsell et al., 2004; Sanchez et al., 2004; Yabroff et al., 2004).

In a review of return to work in cancer survivors, Mehnert (2010) reported rates of return to work ranging between 24-72% at 6 months, 50-81% at 12 months, and 64-

82% at18 months. He reported that although several researchers did not specify the time since cancer diagnosis or treatment completion, other researchers reported a steady increase in employment over time, from an average of 40% at 6 months, 62% at 1 year, and 89% at 2 years. These differences in lengths of time to return to work have been reported of survivors' "time since diagnosis", ranging from 6 months to 20 years. Due to the absence of interval events and the diverse definitions of return to work in many studies, there is no existing reliable structure or framework for measuring return to work in cancer survivors. Many researchers calculate sick days as a gap in employment and as a consequence, employment rate calculations in most prospective studies include temporary lapses, not permanent absence from workforce participation. It is irrelevant to report temporary lapses when comparing employment rates to matched controls or reference groups. Thus, these designs result in erroneous estimates of employment rates. It is proposed that this study provided more accurate estimates of employment rates by defining non-participation in the workforce as the first gap in employment and to not consider sick pay when calculating employment rates.

The results of two systematic reviews revealed that approximately 62% (range 24-94%) of cancer survivors returned to work when treatment was completed (Mehnert, 2010; Spelton et al., 2002). Bouknight et al. (2006) reported that 82% of breast cancer survivors were working at 1 year after diagnosis, yet other researchers reported return to work rates ranging from 50% to 81% at 1 year after diagnosis (Mehnert & Koch, 2011). Again, as can be seen there are large variations reported even within the short interval of 1 year after diagnosis. In the current study, participants were more likely to experience a gap in employment within only 6 months of diagnosis. Nevertheless, seventy-nine

percent of CRC survivors in this study were working at 1 year after diagnosis, a considerably higher percentage than reported in prior studies of CRC survivors. Of those who experienced a gap in employment in this study (n=27) 8 (30%) returned to work within the first year. Of the 13 participants who returned to work after a gap, the duration from loss of employment ranged from approximately 3 months to 39 months (M=11.6 months, SD=9.4).

Given the differences in estimates of return to work for cancer survivors, perhaps the definition of "return to work" should be reframed to more accurately reflect the measurement of employment patterns of cancer survivors as cancer patients often continue to work during treatment (Feuerstein, 2009). Many studies do not account for interval gaps and re-entry over long periods of time (Foster et al., 2009). The definition of "return to work" should be redefined as "continued employment" because many cancer survivors continue to work throughout treatment especially with the advent of oral chemotherapy and less toxic treatments (Kopec et al., 2007).

The findings of the current study revealed that sustained employment declined over time, both voluntarily or involuntarily. In the current study, only 7% of participants left work involuntarily, most commonly due to being fired or laid off due to cancer or stating that they were unable to perform work duties. The findings of this study revealed that those with adequate sick pay were more likely to remain employed; therefore, gaps in employment may have been avoided if accommodations such as sick pay were available, yet as reported, two participants left employment even though that they were provided flexible hours and reduced hours during treatment. Most participants (82%) experienced a gap in employment due to declining health, an inability to perform job

duties, enforced by their employer, or choosing to take early and permanent retirement. Sanchez (2004) reported that those who did not return to work did not feel “physically able” to do the work or stated “medical reasons” (p.505). In this study, the majority of reasons for leaving work both voluntarily and involuntarily were because of health. Interestingly, involuntary also included reasons including an inability to perform job duties. If adequate sick pay or greater support from an employer were available, would they have remained in their jobs? It is debatable whether those who reported leaving a job voluntarily due to poor health were entirely voluntary, especially for those who were self-employed. As reported in most studies, participants rarely reported being fired or laid off because of cancer (Bednarek & Bradley, 2005; Maunsell et al., 2004; Sanchez et al., 2004; D. E. Stewart et al., 2001).

Adequate sick pay or flexible work hours can be considered an accommodation in the workplace, yet in this study perceived accommodations did not significantly correlate with a gap in employment. Participants were asked if they perceived having adequate accommodations from their employer at diagnosis. Of the 71 respondents, 23% (n=16) reported that they had inadequate accommodations. Regardless, most (89%) of those who reported inadequate accommodations remained in their job, perhaps due to financial constraints or reliance on their employer for health insurance, otherwise known as “job lock”(Stroupe, Kinney, & Kniesner, 2001, p.525). Previous investigators have reported that workplace accommodations available to cancer survivors are an important correlate of employment status (Feuerstein, 2009).

One possible reason that there was no association between accommodations and a gap in employment may be because of misinterpretation of the meaning by the

responders. Although the word “accommodation” has been used frequently in the disability literature, the definition is vague for those who face life-threatening illnesses such as cancer. A number of possibilities for this unexpected finding in the current study may exist. Some cancer survivors may not perceive themselves as having a disability that would warrant an accommodation as they personally define one. In this study, almost half of participants who worked full-time reported that they reduced their hours at some point since diagnosis, which is a type of accommodation. This finding suggests that the participant did not view flexible work hours provided by the employer as an accommodation.

Accommodations have traditionally been well defined for the physically disabled who require more observable allowances such handicap accessible entrances or ergonomically designed workstations. Unlike these more obvious and well known accommodations provided to the disabled, those who are treated for cancer experience more intangible disabilities, such as fatigue, and may benefit more from periodic work breaks during the day, working from home, or self-paced and flexible work schedules, which may seemingly be more difficult to “reasonably” provide from the employers’ perspective and unattainable from the cancer survivor’s point of view. Torp, Nielsen, and Gudhhergsson (2011) reported that the most common workplace adjustments for a sample of 653 cancer survivors with varying diagnoses was to reduce or change the number of work hours per week. In this study, adequate sick pay may have been perceived as a reasonable and adequate expectation of accommodations thereby not significantly correlating with a gap in employment.

It is interesting to note that the findings of the current study also revealed that all of those who experienced a gap in employment and subsequently returned to work, 13 did so within 3 years of leaving, most frequently within the first year (n=8). Short et al. (2005) also found that most survivors who reported a gap in employment returned to work within the first year of leaving the workforce. Considering that most gaps in employment occurred within the first 6 months of diagnosis in this study, educational interventions to inform patients of workplace rights and employer responsibilities are most likely needed between diagnosis and shortly after treatments begin.

The Relation of Individual, Disease and Work-related Factors to Work Patterns

Although four variables were statistically significantly related to a gap in employment in the overall model, only education had a significant influence on whether a participant became unemployed. This finding was unexpected, although it is consistent with previous research (Bednarek & Bradley, 2005; Carlsen et al., 2008; Taskila-Brandt et al., 2004).

The findings of this study also indicated that those with poorer QOL were more likely to experience a gap in employment compared to those with better QOL. This finding may seem intuitive if the assumption is that those who reported a gap in employment have greater symptom severity than those who continue to work. However, another explanation may be that the benefits of work participation may have been synergistic and indirectly improved QOL for those working and further contributed to a return to normalcy, accomplishment, self-worth and a healthy distraction (Hounshell et al., 2001; Peteet, 2000).

Although depression was not a significant predictor of a gap in employment, it was also included in the final model. Depression scores were better in those who did not experience a gap in employment compared to those who did, consistent with prior research suggesting that depression is a major risk factor for unemployment (Goetzel et al., 2003) Four of the five participants who self-reported either moderate depressive disorder (MDD) or other depressive disorder (Feuerstein et al.) experienced a gap in employment. Indeed, unemployment has been highly correlated with mental distress (Paul & Moser, 2009).

Unlike prior study findings, the findings of this study did not suggest that time since diagnosis influenced continued employment as reported in three systematic reviews (Mehnert, 2010; Short et al., 2005; Taskila-Brandt et al., 2004). Time since diagnosis has consistently been a factor that influences return to work. Spelton et al. (2002) reported that time since treatment was the only disease and treatment related factor that was associated with return to work. One possible explanation that time since diagnosis was not significantly related to a gap in employment is that the analysis was limited to up to 3 years since diagnosis due to the lack of variability of data.

This study did not yield evidence that there was an association between age and a gap in employment nor did gaps in employment in this study show early retirement to greatly influence continued employment; only two participants took early retirement in this study. Additionally, optional or early retirement may not seem attractive in today's economic environment for those near retirement age. According to the annual retirement confidence survey of 2011, the Employee Benefit Research Institute found that retirement for 20% of responders would be delayed because of the poor economy or a change in

employment situation (Davis, 2012). This may account for those close to retirement feeling compelled to remain working for longer than the traditional retirement age of 65 years. Another factor often reported as significantly affecting job status is gender. Gender was also a non-predictor of employment gaps unlike other studies (Sanchez et al., 2004; P. Schultz et al., 2002). Bradley et al. (2006) reported that women treated for breast cancer initially return to work later as compared to men, but shortly thereafter showed similar patterns of return to work. Considering that this study reported survivors up to 6 years from treatment, differences in gender may have disappeared.

Another interesting finding of this study is that the unemployment rate of this population was 18.6%. As of December 2013, the U.S. unemployment rate reported by the Bureau of Labor Statistics was 6.7% (U.S. Bureau of Labor Statistics, 2014). Most participants in this sample were highly educated, worked in professional occupations, and were less than 65 years old. Individual risk factors for remaining unemployed include less education, older age, and a lower commitment to employment makes this finding even more provocative (Skarlund, Ahs, & Westerling, 2012).

Relation of Presenteeism to the Colorectal Cancer Survivor

Contrary to previous studies, this study did not reveal that cancer survivors experience greater work limitations compared to people with other chronic illnesses, such as heart disease and arthritis (Kessler et al., 2001). Only WLQ physical limitation scores were lower in study participants when compared to a population control group. In spite of work limitations, Kessler et al. (2001) reported that 88 percent of employed people who develop cancer remain at work both during and after a cancer diagnosis.

It is remarkable to note that higher education was significantly related to continued employment but not significantly related to presenteeism. Interestingly, five of the six participants who had outlier productivity loss scores were at least college educated. Spelton et al. (2002) reported that those patients in jobs that were more physically demanding were more likely to experience presenteeism. In this study, those with the greatest presenteeism had higher levels of education yet remained employed. One reason for this finding is that they may have been in jobs that required greater concentration and cognitive skills that may be compromised due to pain medications as described by one study participant in this study. Self-reported productivity loss may have been a result of an inability to learn, process, and recall new information at a slower speed or ability than before treatment suggesting that there may decline in cognitive ability due to treatment. Problems with cognitive changes have consistently been reported by patients receiving chemotherapy who have expressed difficulties organizing daily work, multi-tasking, or developing new skills (Feuerstein, 2009). It is possible that productivity loss due to cognitive deficits is not obvious or measureable and can be concealed. Some researchers suggest that underlying and pre-existing neurological changes and fatigue may exist before treatment in some patients. Cognitive problems have often been attributed to treatment and referred to as “chemo brain” but his concept has been challenged (Cimprich et al., 2012). Cimprich (2012) suggest that cognitive changes may be a result of disease, not treatment. It is unclear whether cognitive changes are a result of disease or treatment.

Private health insurance, poorer QOL and depression significantly contributed to presenteeism in this sample population. The finding that private health insurance was

significantly related to increased presenteeism is surprising. This finding may imply that those with private health insurance have greater access to care resulting in more aggressive treatments that compromise functional status in the workplace. One major concern for those with inadequate health insurance is whether appropriate and sufficient treatment is provided (Ward et al., 2008). It is possible that those with inadequate health insurance may not have received more aggressive treatment compared to those with private health insurance because of cost.

It is not surprising that poorer QOL and depression significantly contributed to the productivity loss. It is interesting to note that poorer QOL and depression were associated with a gap in employment in bivariate analyses only. The impact of depression on work productivity has been reported in several studies and reviews in other chronic disease populations indicating that those with depression have significant productivity loss compared to controls (Goetzel et al., 2003; Goetzel et al., 2004; Kessler & Frank, 2006; Lerner et al., 2004; Lerner & Mosher-Henke, 2008). Yet few researchers have measured the impact of depression or QOL on productivity loss in the cancer population (Feuerstein, Hansen, et al., 2007; Lavigne et al., 2008; W. Stewart et al., 2003), although there is a plethora of literature published on employment status, including disability rates, in cancer patients (Feuerstein, 2009; Mehnert, 2010; Short et al., 2005).

Although age was not found to be a significant predictor in productivity loss, it was negatively correlated with productivity loss. Although eligibility for participation in this study was the inclusion of those 18-65 years, ages ranged from 31-65 and averaged 52 years with a median age of 56. Because of this restriction in the sample there was less likelihood in finding a significant impact of age. According to the direction of

productivity loss regressed on age, productivity loss was more prevalent in younger participants. This finding may seem counterintuitive but those who are younger in this study were in their mid-fifties. Priorities of this age group are strikingly different from younger age groups and include differences in balancing family and leisure time and financial commitments. In this study younger participants may no longer value work as a priority.

Relation of Adequate Sick Pay Policy to the Colorectal Cancer Survivor

Those participants who had late stage disease and those in trade occupations were significantly more likely to perceive an inadequate sick pay policy than those with early stage disease and in professional or managerial occupations. This is not surprising because it is likely that those with late stage disease and in physically demanding jobs need sick pay the most because of more debilitating symptoms that interfere with recovery (Feuerstein, 2009). In the United States, only one-third to two-fifths of blue-collar, sales, and service sector jobs have paid sick leave, compared to approximately 70% of white collar positions that include executive, professional, technical and administrative jobs (Lovell, 2004).

Grunfeld et al. (2010) demonstrated that employers perceived cancer survivors as significantly more compromised compared to the cancer survivor's perceptions of themselves in the areas of symptom management, the degree to which work would be affected by cancer, and the emotional distress that influences the ability to work. The implications are that employers underestimate the ability of cancer survivors who are productive contributors to the workforce. This disparity in perception is often ignored by employers who are inpatient and do not consider that flexible work hours, adequate sick

pay, or working from home would successfully ease survivors back to work (Taskila et al., 2005). There is evidence to suggest that if the workplace is a non-supportive work environment, cancer survivors are less likely to continue to be employed, including those who report leaving voluntarily most commonly due to declining health (Torp, Gudbergsson, Dahl, Fossa, & Flotten, 2011). Participants in this study scored comparably on time management, mental interpersonal, and the output scales as well as the overall WLQ productivity loss score compared to matched controls. The only exception was a lower score on the physical scale on the WLQ compared to matched controls. Interestingly, scores on the QLQ C-30 physical domain scale were the same as the referent group who are likely receiving treatment and typically experience more physical distress compared to survivors. Regardless of the lower physical scale score on the WLQ, 80% were employed at the time of data collection and continued to be productive employees.

Policy Implications

Based on the findings of this study, CRC survivors with late stage disease and in service or trade occupations were significantly more likely to perceive having an inadequate sick pay policy. The United States is the only country that does not provide paid sick pay for cancer patients undergoing a fifty-day cancer treatment regimen (Heymann, Rho, Schmitt, & Earle, 2009). In many countries employees are not paid by employers but are supported by governmental social-insurance programs. Although some states within the United States are increasingly developing legislation that provides temporary disability benefits in the form of paid sick days, it has been challenging for proponents to convince legislators to adopt this policy. The consequences of not

accommodating cancer survivors to take time off for illness can jeopardize recuperation and ultimately longer recovery times due to worsening physical and psychological distress. Additionally, lack of paid sick days for employees can have a substantial impact on the economy as a whole and on individual working Americans and their families who are challenged with a diagnosis of cancer.

Clearly, there are disparities in access to sick pay for employees faced with devastating illnesses that prevent them from seeking medical care or rehabilitation that would allow a more seamless reentry into the workforce. Many cancer patients continue to work during treatment especially since the advent of oral chemotherapy agents that allow patients to have more control over their time and more flexibility in all aspects of their lives including work. Additionally, remote access to work allows many employees to work from home. Findings of prior studies revealed that employment rates increased over time and were inclusive of participants who had temporary gaps in employment including temporary disability or medical leave. In this study, employment was regarded as removal from the workforce for other than temporary leave from diagnosis to the time of survey up to 7 years of survivorship. Ideally, the provision of an adequate sick pay policy may avoid disruption of work and create an easier transition for continued employment in the cancer survivor.

Nursing Practice Implications

Nurses are in an ideal position to provide guidance for patients with cancer who choose to return to work but must develop a systematic assessment of work related-issues. Ideally, a comprehensive assessment should begin soon after diagnosis and continue to completion of treatment. Continued assessments and a plan of care can also

be incorporated into nurse directed survivorship programs that are becoming increasingly common in cancer treatment centers.

It has been proposed that a comprehensive assessment regarding the ability of cancer patients to work during and after treatment should be integrated into a cancer care plan (President's Cancer Panel, 2004) . Assessment of work status will help the patient, the employer, and the clinician to better understand the needs of the patient for work issues. An assessment can determine whether a particular job is still suitable for a patient, whether accommodations can be made by the employer, and there are financial challenges for the patient. In a systematic review of return to work literature, Tamminga, de Boer, Verbeek, and Frings-Dresen (2010) established three components, person and environment and a combination, that should be addressed after an assessment. Person-related components included encouragement, education, and counseling about work. Environmental components focused on communications between the clinicians and the employer. Nursing interventions using some of these components have been instituted. Tamminga et al. (2010) conducted a randomized controlled trial based on the finding of their integrated review. Staff nurses, social workers, or a nurse practitioner participated in a work-directed assessment and intervention that began with early vocational rehabilitation, regular counseling sessions, and communication with the employer to develop a return to work plan.

Theoretical Implications

Other models have been proposed to address employment patterns of the cancer survivor since the publication of the “Pathways to Work Life Recovery” model. One recently published model is the “Cancer and Work Model” which focuses on policy,

disability prevention, and management rehabilitation of cancer survivors who consider work a priority in their lives (Feuerstein et al., 2010). Feuerstein et al. (2010) acknowledged that policies, procedures, and economic factors can influence workplace outcomes such as return to work, sustained employment, work ability, and work performance of the cancer survivor. The "Cancer and Work Life Recovery" model goes a step farther than the "Pathways to Work Life Recovery" model by providing a framework to identify barriers to optimal work function and developing interventions often found in the work disability prevention field. The CMNHP can be linked to either work model. The CMNHP extends both models by emphasizing the need to understand the historical, social, economic, and political context that influences and guides current and future policy change.

Limitations

The major limitation of this study is the lack of a more diverse sample. Most study participants were highly educated and motivated, there was a lack of variation in race, and most worked in professional positions. The findings of this study may not have identified those survivors who are at greatest risk for unemployment and a lack of accommodations, especially for passive non-responders in this study. The second major limitation of this study was the challenge in comparing the findings of this study to reported outcome studies that did not clearly reveal how return to work was defined and calculated.

The power analysis for the study sample size indicated a need for 200 participants. Consequently, the small sample size resulted in what should be considered preliminary findings that provide estimates of effect sizes that could be used for sample

size calculations for a larger scale-study. Another limitation is that the lack of variability of data for gaps in employment after year 3 prevented further survival analysis.

Conclusions

Significant life changes, such as experiencing a diagnosis of cancer, can result in career adjustments that can be challenging for cancer survivors. The importance of measuring continued employment status is supported by this study. Less toxic treatments, improved symptom management, and the more frequent use of oral chemotherapy may enable patients to remain employed during treatment. Interventions to exchange important information with survivors who re-enter the workplace can be coordinated by clinicians including nurses starting shortly after diagnosis. Nurses in particular should take this opportunity to counsel patients while in treatment and into survivorship.

APPENDIX A

FINAL SURVEY: DEMOGRAPHIC EMPLOYMENT PATTERNS AND SICK LEAVE BENEFITS QUESTIONNAIRE (DEPSLBQ)

DEPSLBQ

PARTICIPANT # _____ **DATE _____|____|_____**

PLEASE COMPLETE BOTH SIDES OF THE QUESTIONNAIRE

Demographic, Employment Patterns and Sick Leave Benefits Questionnaire (DEPSLBQ)

First, we would like to know a little bit about you and your employment experience.

1. What was your employment status at the time of your diagnosis?
   - O Employed full time
   - O Employed part time
   - O Not employed **(YOU MAY DISCONTINUE THIS SURVEY; THANK YOU FOR YOUR TIME)**
2. When were you diagnosed with cancer?
   _____/_____
   Month Year
3. What did your treatment include? **Please check all that apply.**
   - O Chemotherapy
   - O Radiation
   - O Surgery
4. When did you complete treatment for cancer?
   _____/_____
   Month Year
   - O I am currently receiving treatment or completed treatment less than 6 months ago **(YOU MAY DISCONTINUE THIS SURVEY; THANK YOU FOR YOUR TIME)**
5. When was the first time you became unemployed since your diagnosis of cancer except for sick/personal or other temporary leave and/or temporary disability?
   - O _____/_____ 1st gap
     Month Year
   - O I have had no gaps in employment since my diagnosis except for sick/personal or other temporary leave and/or temporary disability. **SKIP TO Question 8**
6. Did you leave your job voluntarily **or** involuntarily the 1st time you left your employment since your diagnosis of cancer? (Please indicate the one most important reason)
   - O Voluntarily (check all subcategories that apply)
     - O Because of your health
     - O Recommended by your MD
     - O Encouraged by your employer
     - O Influenced by family and friends
     - O Chose to take advantage of other opportunity
     - O Unable to perform job duties.
     - O Retired
     - O Early retirement
     - O Other_____

PARTICIPANT # _____ DATE _____|____|_____

PLEASE COMPLETE BOTH SIDES OF THE QUESTIONNAIRE

Demographic, Employment Patterns and Sick Leave Benefits Questionnaire (DEPSLBQ)

- O Involuntarily (check all subcategories that apply)
  - O Because of your health
  - O Imposed by your family or MD
  - O Enforced by your employer (fired/laid off **due** to your cancer)
  - O Enforced by your employer (fired/laid off **NOT due** to your cancer)
  - O Troubled by your co-workers
  - O Unable to perform job duties
  - O Retired
  - O Other_____
    _____

7. Have you returned to work since the 1st time you left your employment since your diagnosis or treatment for cancer?
   - O Yes, _____/_____ (Month Year)
   - O No, I have not returned to work since my diagnosis or treatment.
8. What type of health insurance did you have at time of diagnosis?
   - O Private (ie. HMO, BCBS)
   - O Medicaid
   - O Medicare
   - O Government
   - O Cobra
   - O No health Insurance (self-pay)
9. Did you have an adequate sick pay policy at the time of your cancer diagnosis?
   - O Yes
   - O No
10. How many paid sick days (for example, all at once, piecemeal, borrowed from co-worker) did you use due to cancer from diagnosis to end of treatment?
    - O None
    - O _____ days
11. How many unpaid sick days did you use due to cancer from diagnosis to end of treatment?
    - O None
    - O _____ days
    - O Not applicable (ie. Self-employed)
12. How many people were working for your employer at the time of diagnosis?
    - O Fewer than 11 Full Time employees
    - O 11-50 employees
    - O Between 51-100 employees
    - O Between 101-500 employees
    - O 500 or more employees
13. Did you change your work hours since you were diagnosed or treated for cancer?
    - O Yes, reduced hours
    - O Yes, increased hours
    - O No change in hours

PARTICIPANT # _____ DATE _____|____|_____

PLEASE COMPLETE BOTH SIDES OF THE QUESTIONNAIRE

Demographic, Employment Patterns and Sick Leave Benefits Questionnaire (DEPSLBQ)

14. Did your employer make accommodations or adjustments for your work at the time of your diagnosis and treatment?

- O Yes (Please describe, for example: work schedule changes) _____
- O No
- O Not applicable

15. What was your Job Title at the time of diagnosis? _____

16. How would you describe your primary job at the time of diagnosis?

- O Professional, Technical, and Managerial occupations (such as: engineer, computer programmer, professional sales, physician, nurse, teacher, manager in manufacturing or construction)
- O Clerical and Sales occupations (such as: secretary, cashier, shipping clerk)
- O Service Occupations (such as: waiter/waitress, housekeepers, usher, firefighter, police officer, janitor, Military)
- O Agricultural, Fishery, Forestry, and Related Occupations (such as: farmer, fisherman, logger)
- O Machine Trades, Benchwork, or Structural work occupations (such as: iron worker, crane operator, pile driver, machinist, metalworker, mechanic, printer, painter, tailor, welder, roofer, construction, truck driver, etc.)
- O Other _____

17. How would you describe your current employment status?

- O Employed full time
- O Employed part time
- O Not currently employed → **SKIP TO QUESTION 20**

18. What is your current job title? (If applicable) _____

19. How would you describe your current and primary job?

- O Professional, Technical, and Managerial occupations (such as: engineer, computer programmer, professional sales, physician, nurse, teacher, manager in manufacturing or construction)
- O Clerical and Sales occupations (such as: secretary, cashier, shipping clerk)
- O Service Occupations (such as: waiter/waitress, housekeepers, usher, firefighter, police officer, janitor, Military)
- O Agricultural, Fishery, Forestry, and Related Occupations (such as: farmer, fisherman, logger)
- O Machine Trades, Benchwork, or Structural work occupations (such as: iron worker, crane operator, pile driver, machinist, metalworker, mechanic, printer, painter, tailor, welder, roofer, construction, truck driver, etc.)
- O Other _____

PARTICIPANT # _____ DATE ____|____|_____

PLEASE COMPLETE BOTH SIDES OF THE QUESTIONNAIRE

Demographic, Employment Patterns and Sick Leave Benefits Questionnaire (DEPSLBQ)

Please tell me more about your employment experiences since being diagnosed with cancer.

_____
_____
_____
_____
_____
_____
_____

PROCEED TO REVERSE SIDE IF NEEDED

Now, please tell us a little bit about yourself.

20. Are you male or female?

- O Male
- O Female

21. When were you born?

____/____/_____
Month Day Year

22. What is the highest grade you completed? (select one)

- O Less than high school
- O High school/GED
- O Associates degree or vocational/trade school
- O Some college
- O 4 year college degree
- O Graduate degree
- O Post-masters or professional degree

23. What is your current marital status?

- O Single, never married
- O Married/Living with significant other
- O Separated
- O Divorced
- O Widowed

24. What is your race?

- O American Indian or Alaska Native
- O Asian
- O Black or African American
- O Native Hawaiian or Other Pacific Islander
- O White
- O Other (please specify): _____

25. What is your ethnicity?

- O Hispanic or Latino
- O Not Hispanic or Latino

PLEASE PROCEED TO THE QUESTIONNAIRE ON THE NEXT PAGE

APPENDIX B

THE COGNITIVE INTERVIEW GUIDE/DATA COLLECTION FORM

Cognitive Interview Guide/Data Collection Form

Participant #:
Cognitive Interview Script #:
Nurse/Manager:

Introduction

The purpose of our interview today is to have you test a survey. We'll ask you to take the survey, and after you are finished we will ask you several questions about what you thought of it. It is helpful for us to hear your general reaction to the survey as a whole, as well as any particular comments you had about specific questions. There are no right or wrong comments-we are interested in hearing what you think.

As you go through the survey, please tell me if you have any issues with a specific question (question comprehension, terminology comprehension, answer categories, etc). We'll go back and discuss that question when you are done with the survey.

I. Participant Discovered Survey Issues:
(Take notes on any questions that participants had issues with and noted while taking the survey)

II. Question-Specific Issues (Frequency, severity, and interference questions)

Use this space to record issues with specific questions or scales, and in each entry, please note question #s.

I. Terminology Issues:

A. (SAFETY PRACTICES QUESTIONS – page 4)
Q.114 Unsafe working conditions on the unit are identified promptly?
Q.115 Unsafe working conditions on the unit are improved promptly?

- *What did the term "unsafe working conditions" mean to you?*

B. (DISABILITY MANAGEMENT QUESTIONS – page 10)
Q.30 I have adequate resources to assist employees with referral for disability benefits or leaves (FMLA).

- *What did the term "adequate resources" mean to you?*

II. Question Interpretation Issues:

- *How do you interpret the following questions?*

A. (SAFETY PRACTICES – page 4)
Q.117 When employee infractions occur impacting employee safety on this unit, hazards are addressed. *(SHOULD WE REMOVE "EMPLOYEE" AND JUST HAVE "INFRACTIONS")*

B. (ERGONOMIC PRACTICES – page 5)
Q.17 Work is desiged to reduce patient lifting.
Q.21 Work assignments are matched to the physical capabilities of a worker.

C. (ACTIVE SAFETY LEADERSHIP – page 6)
Q.31 My direct supervisor is actively involved with safety issues on my unit.
Q.33 I have opportunity to communicate unit safety strategies with my peers and senior nursing leadership.

Q.34 My unit spends time and money on improving safety performance.
Q.38 Unit injury reports are helpful when developing my unit safety plan.

III. Scales:

A. (Section 3: page 9)
Q.61C On an average week, how often do you admit patients to your unit whose care is dissimilar to the patients your staff normally care for on the unit (ie different population, diagnoses, or supply and equipment needs)?
0 1 2 3 4 5 6 7

-- *What did these numbers mean to you (times/days)?*
Alternative – *Never/Almost Never, Occasionally, Frequently, Always/Almost Always*

B. (Page 15/17): Never-Frequently scales.
Q. 4-7, Q.8-14 - *Was there a scale that you preferred?*
- (Never/Almost Never, Occasionally, Frequently, Always/Almost Always)
- (1 (Never), 2, 3, 4, 5 (Frequently)
Notes:

D. Critical question 4/5: Level of comfort and manner of responding to the recall period.

(Record level of ease/difficulty in thinking back over the last year, as well as reported recall strategies). How did you think about the last year? Did you just answer generally?

III. General Issues

Overall, what was your general reaction to the survey?

Was the interview ok in terms of the length, or was it too long?

Overall Ease of Answering Questions (Easy/Mixed/Difficult): _____
Issues that made it difficult to answer the survey overall:

Overall, when you were answering these questions, what time period did you think about?
Comments:

Is there anything else you would like us to know about this questionnaire? Do you have any suggestions for improving it for other staff?

APPENDIX C

PRE-TEST INTRODUCTORY COVER LETTER

PRE-TEST INTRODUCTORY COVER LETTER

Introduction

The purpose of our interview today is to have you test a survey. We'll ask you to take the survey, and after you are finished we will ask you several questions about what you thought of it. It is helpful for us to hear your general reaction to the survey as a whole, as well as any particular comments you had about specific questions. There are no right or wrong comments-we are interested in hearing what you think.

As you go through the survey, please tell me if you have any issues with a specific question (question comprehension, terminology comprehension, answer categories, etc). We'll go back and discuss that question when you are done with the survey.

APPENDIX D

PILOT: DEMOGRAPHIC EMPLOYMENT PATTERNS AND SICK LEAVE BENEFITS QUESTIONNAIRE (DEPSLBQ) & SUMMARY OF AMENDMENT CHANGES TO "DEPSLBQ" QUESTIONNAIRE

Questions for employed persons

1. What is your current employment status?

    1. Employed more than or equal to 32 hours a week
    2. Employed less than 32 hours a week
2. Did you work **at the time of diagnosis and** during treatment?
   Yes No → **Skip to Question #5**
3. Did you use paid sick days during treatment?

    1. No
    2. Less than 10 days
    3. More than 10 days

4. Did you use unpaid leave during treatment?
    1. No
    2. Less than 10 days
    3. More than 10 days

5. How large is your company?
    1. Less than 20
    2. Between 20-100
    3. More than 100

6. Did you **continue to work after treatment?**
   Yes → No **Skip Question #10**

7. Did you return to work after treatment?

    1. Remained working throughout treatment
    2. 1-3 months
    3. 3-6 months
    4. 6-12 months
    5. 1 to 2 years
    6. 2 years to 6 years

8. Did you **permanently** change your work hours after treatment?

    1. Increased work hours
    2. Decreased work hours
    3. No change in work hours
9. Have you remained with the same employer?

    Yes No

10. Did you leave your job
    1. Voluntarily
        1. Because of health
        2. Encouraged by your family, MD
        3. Encouraged by your employer
        4. Changed job
    2. Involuntarily
        1. Because of your health
        2. Imposed by family MD Imposed by your employer (fired/laid off)
        3. Imposed by your employer (fired/laid off)
11. Did you have health insurance?

    Yes No

GO TO QUESTIONNAIRE ON PAGE 1

Questions for persons not employed

1. Did you work at the time of diagnosis and during treatment?

   Yes No → Skip to Question #5

2. Did you use paid sick days during treatment?
   1. No
   2. Less than 10 days
   3. More than 10 days
3. Did you use unpaid leave during treatment?
   1. No
   2. Less than 10 days
   3. More than 10 days

4. How large was your company?

   1. Less than 20
   2. Between 20-100
   3. More than 100
5. Did you return to work after treatment?

   1. No → Proceed to question 8
   2. 1-3 months
   3. 3-6 months
   4. 6-12 months
   5. 1 to 2 years
   6. 2 years to 6 years

6. Did you change your work hours after treatment?
   1. Increased work hours
   2. Decreased work hours
   3. No change in work hours

7. When did you last work? _____mo/year

8. Did you leave your job

APPENDIX E

WORK LIMITATIONS QUESTIONNAIRE (WLQ)

Fill in Today's Date

Month		Day		Year	

Instructions

Health problems can make it difficult for working people to perform certain parts of their jobs. We are interested in learning about how your health may have affected you at work during the past 2 weeks.

(1) The questions will ask you to think about your physical health or emotional problems. These refer to any ongoing or permanent medical conditions you may have and the effects of any treatments you are taking for these. Emotional problems may include feeling depressed or anxious.

(2) Most of the questions are multiple choice. They ask you to answer by placing a mark in a box.

For example:

How satisfied are you with each of the following . . .?

(Mark one box on each line a. and b.)

	Not At All Satisfied	Moderately Satisfied	Very Satisfied
a. Your local schools.	☐1	☐2	■3
b. Your local police department. . .	☐1	■2	☐3

These marks tell us you are very satisfied with your local schools and moderately satisfied with your local police department.

APPENDIX F

EUROPEAN ORGANIZATION FOR RESEARCH AND TREATMENT (EORTC)

QUALITY OF LIFE QUESTIONNAIRE (QLQ) C-30

EORTC QLQ-C30 (version 3)

We are interested in some things about you and your health. Please answer all of the questions yourself by circling the number that best applies to you. There are no "right" or "wrong" answers. The information that you provide will remain strictly confidential.

Please fill in your initials: [ ][ ][ ][ ]
Your birthdate (Day, Month, Year): [ ][ ] [ ][ ] [ ][ ][ ][ ]
Today's date (Day, Month, Year): 31 [ ][ ] [ ][ ] [ ][ ][ ][ ]

	Not at All	A Little	Quite a Bit	Very Much
1. Do you have any trouble doing strenuous activities, like carrying a heavy shopping bag or a suitcase?	1	2	3	4
2. Do you have any trouble taking a long walk?	1	2	3	4
3. Do you have any trouble taking a short walk outside of the house?	1	2	3	4
4. Do you need to stay in bed or a chair during the day?	1	2	3	4
5. Do you need help with eating, dressing, washing yourself or using the toilet?	1	2	3	4

During the past week:

	Not at All	A Little	Quite a Bit	Very Much
6. Were you limited in doing either your work or other daily activities?	1	2	3	4
7. Were you limited in pursuing your hobbies or other leisure time activities?	1	2	3	4
8. Were you short of breath?	1	2	3	4
9. Have you had pain?	1	2	3	4
10. Did you need to rest?	1	2	3	4
11. Have you had trouble sleeping?	1	2	3	4
12. Have you felt weak?	1	2	3	4
13. Have you lacked appetite?	1	2	3	4
14. Have you felt nauseated?	1	2	3	4
15. Have you vomited?	1	2	3	4
16. Have you been constipated?	1	2	3	4

Please go on to the next page

EORTC QLQ – CR29

Patients sometimes report that they have the following symptoms or problems. Please indicate the extent to which you have experienced these symptoms or problems during the past week. Please answer by circling the number that best applies to you.

During the past week:	Not at All	A Little	Quite a Bit	Very Much
31. Did you urinate frequently during the day?	1	2	3	4
32. Did you urinate frequently during the night?	1	2	3	4
33. Have you had any unintentional release (leakage) of urine?	1	2	3	4
34. Did you have pain when you urinated?	1	2	3	4
35. Did you have abdominal pain?	1	2	3	4
36. Did you have pain in your buttocks/anal area/rectum?	1	2	3	4
37. Did you have a bloated feeling in your abdomen?	1	2	3	4
38. Have you had blood in your stools?	1	2	3	4
39. Have you had mucus in your stools?	1	2	3	4

During the past week:	Not at All	A Little	Quite a Bit	Very Much
40. Did you have a dry mouth?	1	2	3	4
41. Have you lost hair as a result of your treatment?	1	2	3	4
42. Have you had problems with your sense of taste?	1	2	3	4
43. Were you worried about your health in the future?	1	2	3	4
44. Have you worried about your weight?	1	2	3	4
45. Have you felt physically less attractive as a result of your disease or treatment?	1	2	3	4
46. Have you been feeling less feminine/masculine as a result of your disease or treatment?	1	2	3	4
47. Have you been dissatisfied with your body?	1	2	3	4
48. Do you have a stoma bag (colostomy/ileostomy)? (please circle the correct answer)	Yes		No	

Please go on to the next page

APPENDIX G

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

Appendix G

PHQ

PATIENT HEALTH Q (PHQ-9)

NAME: _____ **DATE:** _____

Over the *last 2 weeks,* how often have you been bothered by any of the following problems? *(use "✓" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1		
2. Feeling down, depressed, or hopeless	0	1		
3. Trouble falling or staying asleep, or sleeping too much	0	1		
4. Feeling tired or having little energy	0	1		
5. Poor appetite or overeating	0	1		
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1		
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1		
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	0	1		

APPENDIX H

INTRODUCTION LETTER

Dear

I am requesting your participation in a study about your experience as a colorectal cancer survivor who continued or discontinued work during and/or after treatment. I am an oncology nurse at Dana Farber Cancer Institute who is interested in this area of research and would like to understand how nurses and physicians can help patients continue to work or return to work after treatment if they choose to.

If you decide to participate you will be asked questions about your work, quality of life, and depression. This study involves answering three surveys at one time. The surveys take approximately 30 minutes to complete by either telephone or filling out a questionnaire yourself.

I have either mailed you or given you a packet that includes the questionnaires, the consent, and a postcard indicating your interest in participating or not participating. I have also enclosed a self-addressed stamped envelope that can be used to send materials back.

If you choose not to participate, you may send a self-addressed post-card enclosed in this mailing indicating that you are not interested in participating. You can also call 617-XXX-XXXX and leave a message. Should I not hear from you within 2-4 weeks of sending the packet, I would like to contact you by telephone to tell you more about this study.

You may also send the self-addressed post-card to express your interest in participating. There is a space for you to indicate the best time for me to contact you. If you choose to participate we request that you sign the last page of the consent form and put it in the self-addressed envelope along with the questionnaire or alone if you choose to do the questionnaire by telephone.

Thank you for your consideration,

Kristin Roper, RN

APPENDIX I

OPT-OUT POST CARD – OPTION RESPONSE FORM AND TELEPHONE

MESSAGE SCRIPT

Option Response Form

[ ] Yes, I **would** like to participate in this study.
The best time to contact me is:

Mornings (9-12) Afternoons (1-4) Evenings (7-9)

Name & phone number: _____
Date_____

[ ] I do **not** wish to participate in this study.

Participation is voluntary, and we respect your decision not to participate. However, we would greatly appreciate knowing why you do not wish to do so. Your responses will help us plan future studies.

[ ] I do not feel well
[ ] I am too busy
[ ] It doesn't interest me.
[ ] Other, please explain:

_____
_____
_____

Name & phone number: _____
Date

Please fill in the date and return this form in the attached self-addressed, stamped envelope, or call 617-632-3510 for further information or to accept or decline.

Thank you for taking the time to consider participating in this study.

Telephone Message

Hello, this message is for _____. My name is Kristin Roper and I'm an oncology nurse calling on behalf of Dana Farber Cancer Institute about a letter along with a survey that was sent to you. The purpose of this research survey is to help us understand the experiences of colorectal cancer survivors who continue, delay, or discontinue working during or after treatment. I'd like to give you some information on this study and see if you would like to participate.

I'll call back in a few days to see if I can reach you, in the meantime if you have any questions you can reach me at 617-XXX-XXXX or leave a message. Thank you for your time and I look forward to speaking with you.

APPENDIX J

CODEBOOK

Position	Variable	Label
1	Id	Respondent Measurement Level: Scale
2	Employment	Employment Status at Diagnosis Measurement Level: Nominal Value Label 1 Full-Time Employment 2 Part-Time Employment
3	TimeSinceDX	This continuous variable represents the time since diagnosis to the last survey was received: 12/9/11 Time Since Diagnosis Measurement Level: Scale
4	Stage	This categorical variable is the stage of disease. This variable was recoded to nominal level: CCollapsedStage 1≥3 and 0≤2. Stage at Diagnosis Measurement Level: Ordinal Value Label 1.0 Stage 1 2.0 Stage 2 3.0 Stage 3 4.0 Stage 4 99.0 Missing
5	Treatment	This categorical variable represents the type of treatment received. This variable was recoded to nominal level: CCollapsedTreatment 1=All and 0=Any combination. Treatment Received Measurement Level: Nominal Value Label 1.0 Chemotherapy 2.0 Radiation Therapy 3.0 Surgery 4.0 All combined 5.0 Chemotherapy & Radiation 6.0 Chemotherapy & Surgery 7.0 Radiation & Surgery
6	EmploymentGap	This nominal variable represents a participant reporting whether they experienced a gap in employment other than temporary sick leave or disability. Employment Gap Measurement Level: Nominal

		Value Label 0 working 1.0 quit
7	Voluntary	This categorical variable is included to determine the reasons that individuals left their jobs voluntarily when they experienced their first gap. Voluntarily left job Measurement Level: Nominal Value Label 1.0 Because of health 2.0 Recommended by MD 3.0 Encouraged by employer 4.0 Influenced by family and friends 5.0 Chose to take advantage of other opportunity 6.0 Unable to perform job duties 7.0 Retired 8.0 Early retirement 9.0 Other 88 Not applicable
8	Involuntary	This categorical variable is included to determine the reasons that individuals left their jobs involuntarily when they experienced their first gap. Involuntarily left job Measurement Level: Nominal Value Label 1.0 Because of health 2.0 Imposed by family or MD 3.0 Enforced by employer (fired/laid off due to cancer) 4.0 Troubled by co-workers 5.0 Unable to perform job duties 6.0 Retired 7.0 Other 88 Not applicable
9	RTW	This categorical variable represents whether individuals who experienced a gap in employment returned to work after their first gap in employment. RTW since 1st gap Measurement Level: Nominal Value Label 1.0 Yes 2.0 No 88 Not applicable
10	AdequateSickPay	This categorical variable represents the respondents' perception of whether they believed they had adequate sick pay at time of diagnosis. Adequate sick pay at time of diagnosis Measurement Level: Nominal

		Value Label 1.0 Yes 2.0 No 88 Not applicable: self employed 99 Missing
11	PaidSickPay	This categorical variable represents paid sick days used from diagnosis to end of treatment. Paid Sick days used from diagnosis to end of treatment Measurement Level: Nominal Value Label 1.0 Yes 2.0 No 3.0 None 88 Not applicable: Self employed 99 Missing
12	NumberPaid	This continuous sick pay represents the number of sick days taken from diagnosis to end of treatment. Number of paid sick days used Measurement Level: Ratio
13	UnpaidSickDays	This categorical variable represents unpaid sick days used from diagnosis to end of treatment. Unpaid Sick days used from diagnosis to end of treatment Measurement Level: Nominal Value Label 1.0 Yes 2.0 No 3.0 None 88 Not applicable: Self employed 99 Missing
14	NumberUnpaid	This continuous sick pay represents the number of sick days taken from diagnosis to end of treatment. Number of paid sick days used Measurement Level: Ratio
15	CompanySize	This categorical variable represents the size of the company participants were working in at time of diagnosis. This variable was recoded to nominal variable: CCollapsedCoSize: 1≥500 & 0=<500. Number of employees in company Measurement Level: Ordinal Value Label 1.0 Fewer than 11 FT employees 2.0 11-50 employees 3.0 51-100 employees 4.0 101-500 employees 5.0 500 or more
16	ChangeWorkHrs	This categorical variable represents a change in work hours

		since diagnosis. Change in work hours since diagnosis Measurement Level: Categorical Value Label 1.0 Reduced hours 2.0 Increased hours 3.0 No change in hours
17	Accommodations	This categorical variable represents participant's perceptions of whether they believed they received accommodations from their employer during and after treatment. Accommodations or adjustment at diagnosis Measurement Level: Nominal Value Label 1.0 Yes 2.0 No 3.0 Not applicable
18	CurrentEmploymentStatus	This categorical variable represents participant current employment. Current employment status Measurement Level: Nominal Value Label 1.0 Employed FT 2.0 Employed PT 3.0 Unemployed 4.0 Retired
19	Gender	This categorical represents gender. Gender Measurement Level: Nominal Value Label 1.0 Male 2.0 Female
20	DOB	This continuous variable is date of birth and recalculated to determine age. Birthdate Measurement Level: Ratio
21	Education	This categorical variable represents the educational status of individuals at time of survey. This variable was recoded to a nominal variable: CCollapsedEducation 1≥college graduate & 0 < college. Education Measurement Level: Ordinal Value Label 1.0 Less than HS 2.0 HS/GED

		3.0 AD or VocTrade 4.0 Some College 5.0 Four Year College 6.0 Graduate Degree 7.0 Post-Masters or Professional Degree
22	MaritalStatus	This categorical variable represents the marital status of individuals at time of survey. This variable was recoded to a nominal variable: CCMaritalStatus: 1=married & 0=Not married. Marital Status Measurement Level: Categorical Value Label 1.0 Single, never married 2.0 Married, living with significant other 3.0 Separated 4.0 Divorced 5.0 Widowed
23	HealthIns	This categorical variable represents type of health insurance at diagnosis. This variable was recoded to a nominal variable: CCHealthInsurance: 1=private & 2=other Health Insurance at diagnosis Measurement Level: Categorical Value Label 1.0 Private (HMO; BCBS) 2.0 Medicaid 3.0 Medicare 4.0 Government (state or federal) 5.0 Cobra 6.0 Self-pay 88 Missing
24	Race	This categorical variable represents race. Race Measurement Level: Nominal 2.0 Asian 3.0 African American 4.0 Native Hawaiian or Pacific Islander 5.0 White 6.0 Other
25	Ethnicity	This categorical variable represents ethnicity. Ethnicity Measurement Level: Nominal Value Label 1.0 Hispanic or Latino 2.0 Non-Hispanic or Latino
26	PHQSCORE	This continuous variable is the calculated score for depression using the PHQ-9 for all patients.

		Measurement Level: Ratio
27	MDDp	This categorical variable represents Major Depressive Disorder Measurement Level: Categorical MDD Value Label 0 No MDD 1.0 MDD
28	ODDCTp	This categorical variable represents Major Depressive Disorder Measurement Level: Categorical ODD Value Label 0 No ODD 1.0 ODD
29	QL2	This continuous variable is the calculated score for global health status using the QLQ-C30 Measurement Level: Scale
31	EF	This continuous variable is the calculated score for Emotional Function
32	PF2	This continuous variable is the calculated score for Physical Function
33	RF2	This continuous variable is the calculated score for Role Function
34	CF	This continuous variable is the calculated score for Cognitive Function
35	SF	This continuous variable is the calculated score for Social Function
30	prodlost	This continuous variable is the percent of productivity lost for those participants working at the time of survey. Measurement Level: Scale
31	wlqphys	Physical Scale
32	wlqtime	Time management scale
33	wlqmentl	Mental interpersonal scale
34	wlqout	Output scale

APPENDIX K

INFORMATION AND SUPPORT RESOURCES

~~APPENDIX H~~

Information and Support Resources

Thank you for participating in the DFCI study sharing your experiences as a colorectal cancer survivor who continued or discontinued work during or after treatment. This data will guide and inform in developing an educational intervention for colorectal cancer patients adjusting to or continuing employment after treatment of cancer. We would like to remind you that your questionnaire responses are not part of your clinical care, and we do not share your responses with your Dana-Farber health care providers. After completing surveys like this, people sometimes have questions. If you have concerns about your own physical or emotional health we encourage you to talk to your primary care provider or your mental health care provider; and as always, in an emergency you should call 911. This sheet contains sources of information and support services that may also be useful.

General Cancer Survivor Information

- National Coalition for Cancer Survivorship, 1010 Wayne Avenue-Suite 505, Silver Spring, MD 20910-5600. Phone: (877) NCCS YES (877-622-7937) Web: http://www.canceradvocacy.org/
- National Cancer Institute-Office of Cancer Survivorship, Phone: 301-402-2964 Web: http://dccps.nci.nih.gov/ocs/ and http://www.cancer.gov/cancertopics/types/colon-and-rectal
- Lance Armstrong Foundation, Phone: 512-236-8820. Web: http://www.laf.org.

Survivor Support Services

- The Wellness Community, 919 18th Street, NW, Suite 54, Washington, D.C. 20006. Phone: (888) 793-9355. Web: http://www.thewellnesscommunity.org/. Provides free psychosocial support to people fighting to recover from cancer as an adjunct to conventional medical treatment. 20 facilities nationwide.
- Cancervive, Inc., 11636 Chayote Street, Los Angeles, CA 90049. Phone (310) 203-9232. Web: http://www.cancervive.org. Offers insurance information and assistance and advocacy for cancer survivors.
- Cancer*care*. Free information, telephone counseling and support services for anyone affected by cancer. Phone (800) 813-HOPE. Web: http://www.cancercare.org
- The Colon Cancer Alliance (CCA) Colon Cancer Alliance http://www.ccalliance.org/ .CCA is a community that provides hope and support to patients and their families, while saving lives through screening, access, awareness, advocacy and research.

Information about Depression and Anxiety

- Depression Awareness, Recognition and Treatment Program, National Institute of Mental Health.
  Provides information about depression. 1-800-421-4211. www.nimh.nih.gov.
- Depression and Bipolar Support Alliance. National Office- 1-800-826-3632. Boston Office- 617-855-3665. Web: http:/www.ndmda.org/
- The Samaritans- Crisis line for support and suicide prevention. National Hopeline 1-800-784-2433. Other resources available at http://www.suicidehotlines.com/.

APPENDIX L

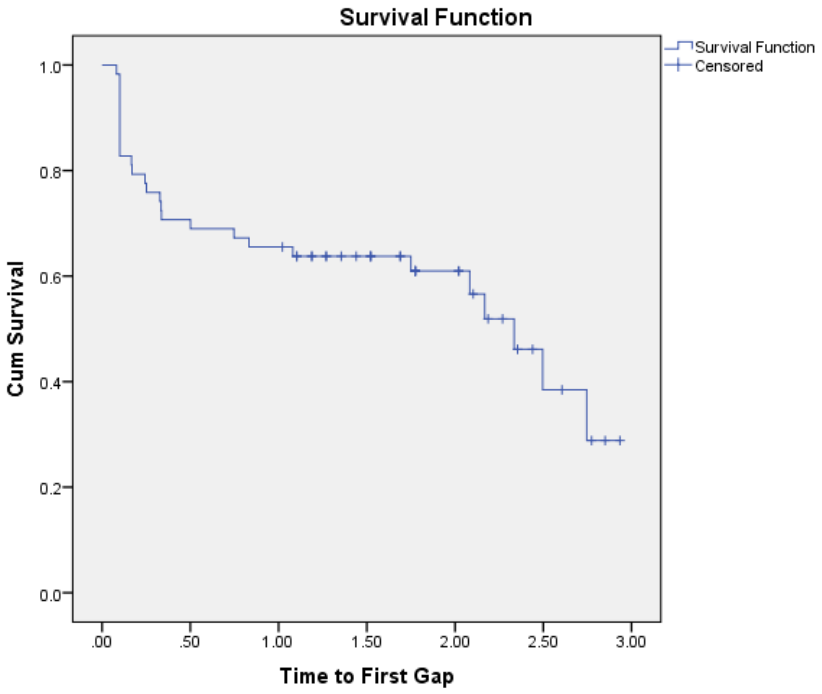
SURVIVAL FROM 6-MONTHS TO SIX YEARS

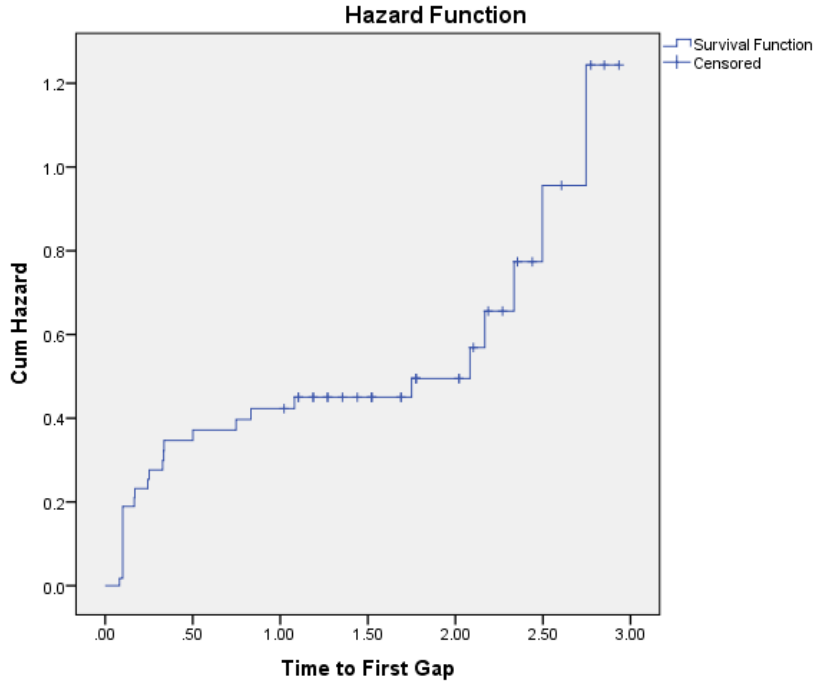
SURVIVAL FUNCTION AND HAZARD FUNCTION

APPEN

Continued Employment Survival Analysis from 6 Months to 6 Years

Time (Yearly)	Number of gaps (d)	Number working prior (n)	Proportion experiencing a gap (d/n)	Proportion working (1-d/n)	Cumulative survival probability © (1-d/n)*c
0-1	20	97	.206	.794	.794
1-2	2	77	.026	.974	(.794*.974) .773
2-3	5	75	.067	.933	(.773*.933) .722
3-4	3	70	.043	.957	(.722*.957) .691
4-5	2	67	.029	.971	(.691*.971) .670
5-6	1	64	.015	.985	(.670*.985) .660


Survival Function
Survival Function
Censored
Cum Survival
1.0
0.8
0.6
0.4
0.2
0.0
.00
.50
1.00
1.50
2.00
2.50
3.00
Time to First Gap


Hazard Function
Survival Function
Censored
Cum Hazard
1.2
1.0
0.8
0.6
0.4
0.2
0.0
.00
.50
1.00
1.50
2.00
2.50
3.00
Time to First Gap

APPENDIX M

QUALITY OF LIFE QUESTIONNAIRE SCORES AND REFERENTS

Instrument QLQ-C30	Observations	Sample Mean	Min	Max	SD	Reference Mean*	t	Significance p-value
Overall QOL (25-100)	97	83.25	25.00	100	16.12	60.7	13.8	*p* =.000
Physical	96	93.33	13.33	100	12.87	79.2	10.8	*p* =.000
Emotional	97	80.93	16.67	100	19.69	68.9	6.0	*p* =.000
Cognitive	97	82.47	16.67	100	22.49	85.2	-1.19	*p* =.235
Social	97	84.02	33.33	100	26.12	76.0	3.02	*p*=.003
Role	97	89.86	16.67	100	22.38	70.4	8.57	*p*=.000
Fatigue	96	17.1	0	100	19.7	34.7	-8.75	*p*=.000
Nausea/vomiting	97	1.89	0	100	10.7	7.3	-4.97	*p*=.000
Pain	97	11.7	0	100	20.6	24.0	-5.90	*p*=.000
Dyspnea	97	8.3	0	100	17.4	17.4	-5.190	*p*=.000
Insomnia	96	26.5	0	100	27.6	30.5	-1.441	*p*=.153
Appetite Loss	97	3.1	0	100	12.9	19.1	-12.164	*p*=.000
Constipation	97	11.0	0	100	21.4	15.8	-2.214	*p*=.029
Diarrhea	96	13.9	0	66.7	22.0	16.6	-1.208	*p*=.230
Financial Problems	97	16.5	0	100	29.3	13.6	.973	*p*=.333

*Patients in clinical trials

APPENDIX N

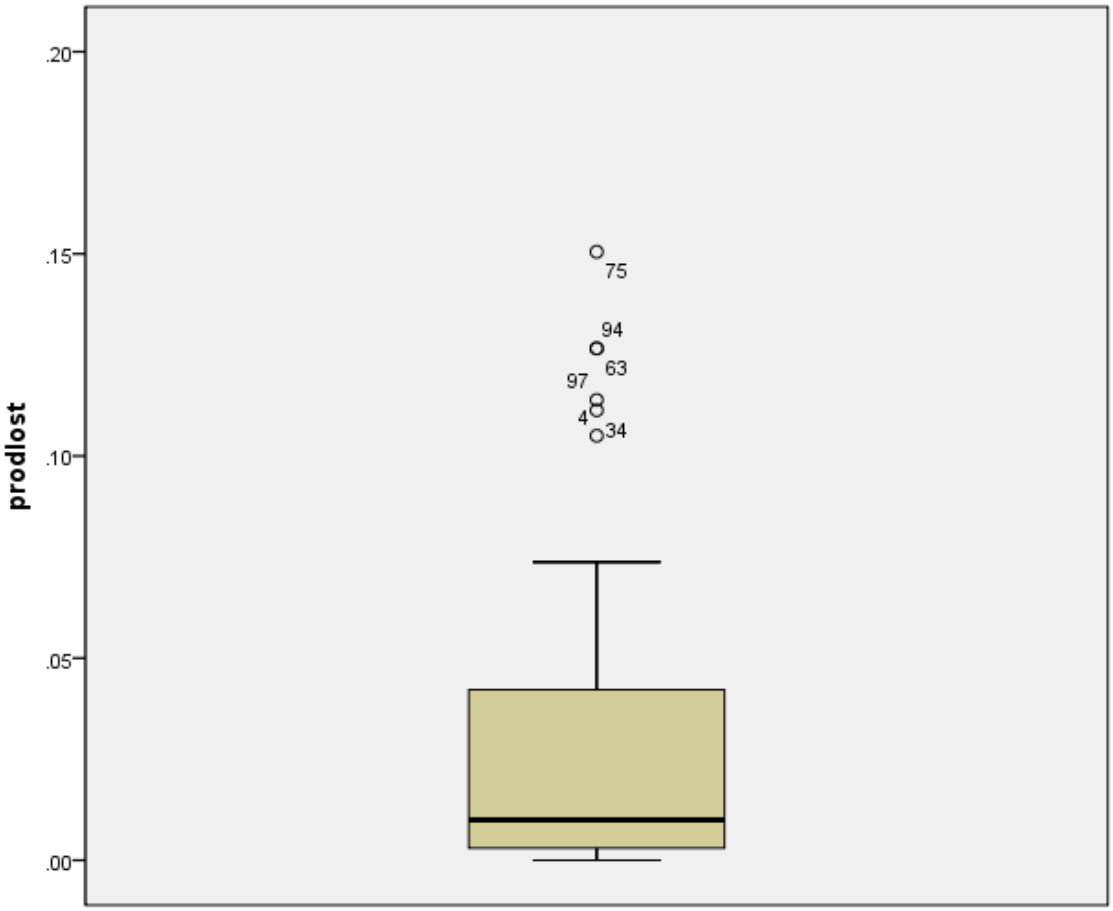
CORRELATIONS OF INDEPENDENT AND DEPENDENT VARIABLES

Correlations of Independent and Dependent Variables

		prodlist	Employment Gap	1=Yes 0=No	Age when diagnosed	Age at time survey was sent	1=Male 0=Female	1=Married 0=Not Married	1=>college 0=College	PHQSCORE	Global health status/QoL	Time Since Diagnosis	1=>3 0=<2	CCollapsedTreatment	0=(Clerical)ServiceTradeOther	1=500+ 0=under500	1=private 0=all other	paidsickdays
prodlist	Pearson Correlation	1																
	Sig. (2-tailed)																	
	N	75																
Employment Gap	Pearson Correlation	.163	1															
	Sig. (2-tailed)	.115																
	N	75	97															
1=Yes 0=No	Pearson Correlation	-.199	-.508**	1														
	Sig. (2-tailed)	.124	.000															
	N	68	88	88														
Age when diagnosed	Pearson Correlation	-.243*	.058	.032	1													
	Sig. (2-tailed)	.036	.570	.975														
	N	75	97	88	97													
Age at time survey was sent	Pearson Correlation	-.249*	.091	-.011	.974**	1												
	Sig. (2-tailed)	.032	.377	.919	.000													
	N	75	97	88	97	97												
1=Male 0=Female	Pearson Correlation	.039	-.142	-.057	.015	-.018	1											
	Sig. (2-tailed)	.737	.166	.634	.856	.822												
	N	75	97	88	97	97	97											
1=Married 0=Not Married	Pearson Correlation	.073	-.066	.016	.043	.041	.347**	1										
	Sig. (2-tailed)	.533	.400	.883	.679	.688	.001											
	N	75	97	88	97	97	97	97										
1=>college 0=College	Pearson Correlation	.125	-.282**	.063	.055	.054	.067	.265**	1									
	Sig. (2-tailed)	.285	.005	.582	.596	.599	.396	.009										
	N	75	97	88	97	97	97	97	97									
PHQSCORE	Pearson Correlation	.367**	.286**	-.086	-.072	-.110	-.054	-.172	-.074*	1								
	Sig. (2-tailed)	.001	.004	.428	.483	.287	.623	.093	.476									
	N	74	96	88	96	96	96	96	96	96								
Global health status/QoL	Pearson Correlation	-.396**	-.236*	.159	.093	.135	-.145	.085	.098	-.658**	1							
	Sig. (2-tailed)	.000	.020	.140	.364	.186	.157	.407	.340	.000								
	N	75	97	88	97	97	97	97	97	96	97							
Time Since Diagnosis	Pearson Correlation	-.043	.149	-.074	.050	.271**	-.125	-.029	-.009	-.184	.200*	1						
	Sig. (2-tailed)	.717	.145	.491	.626	.007	.224	.842	.932	.111	.050							
	N	75	97	88	97	97	97	97	97	96	97	97						
1=>3 0=<2	Pearson Correlation	-.042	.134	-.230	.045	.066	-.032	.153	.000	.030	.070	.068	1					
	Sig. (2-tailed)	.720	.190	.031	.669	.582	.756	.136	.997	.771	.489	.505						
	N	75	97	88	97	97	97	97	97	96	97	97	97					
CCollapsedTreatment	Pearson Correlation	.085	.088	-.007	-.077	-.053	-.067	.015	-.045	-.054	.066	.116	.024	1				
	Sig. (2-tailed)	.469	.385	.949	.451	.601	.516	.884	.674	.602	.625	.261	.800					
	N	75	97	88	97	97	97	97	97	96	97	97	97	97				
1=Prof 0=(Clerical)Service Trade Other	Pearson Correlation	-.082	-.230*	.243*	.099	.103	.128	.074	.395**	-.063	.171	.024	-.113	-.174	1			
	Sig. (2-tailed)	.482	.023	.023	.337	.317	.229	.474	.000	.542	.094	.815	.299	.088				
	N	75	97	88	97	97	97	97	97	96	97	97	97	97	97			
1=500+ 0=under500	Pearson Correlation	-.009	-.102	.150	-.031	-.018	.075	.132	.183	-.083	.060	.052	.075	-.026	.050	1		
	Sig. (2-tailed)	.557	.324	.077	.761	.865	.465	.199	.137	.420	.563	.615	.465	.786	.631			
	N	74	95	86	96	96	96	96	96	96	96	96	96	96	96	96		
1=private 0=all other	Pearson Correlation	.192	-.068	.052	-.098	-.119	-.044	.038	.086	.027	-.019	-.115	-.109	-.102	-.172	-.059	1	
	Sig. (2-tailed)	.099	.508	.578	.342	.248	.672	.771	.401	.793	.858	.261	.289	.321	.093	.567		
	N	75	97	88	97	97	97	97	97	96	97	97	97	97	97	96	97	
paidsickdays	Pearson Correlation	-.225	.024	-.154	.099	.117	-.151	-.140	.056	-.013	.035	.108	-.214	-.079	-.200	-.174	-.073	1
	Sig. (2-tailed)	.065	.827	.173	.373	.291	.169	.204	.613	.905	.755	.330	.051	.482	.068	.114	.512	
	N	69	84	80	84	84	84	84	84	84	84	84	84	84	84	84	84	84

APPENDIX O

WLQ OUTLIERS



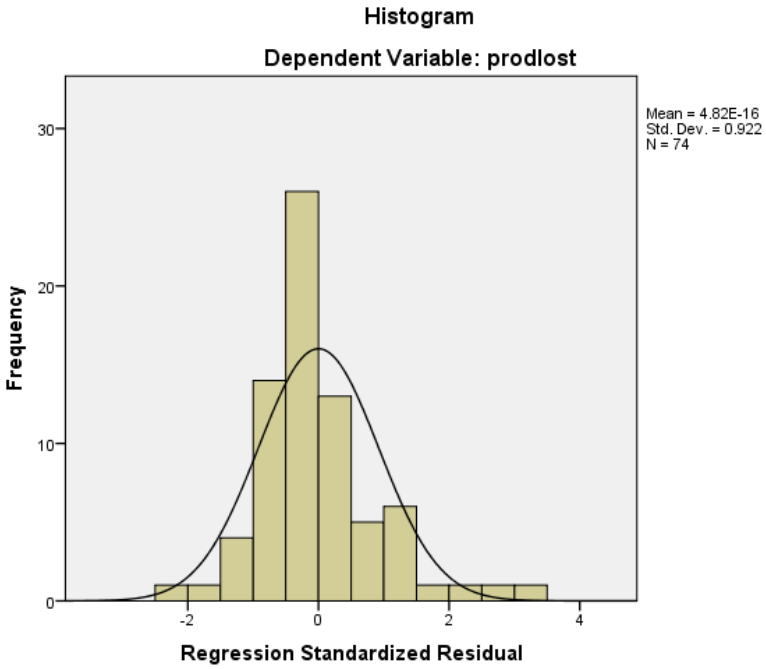
APPENDIX P

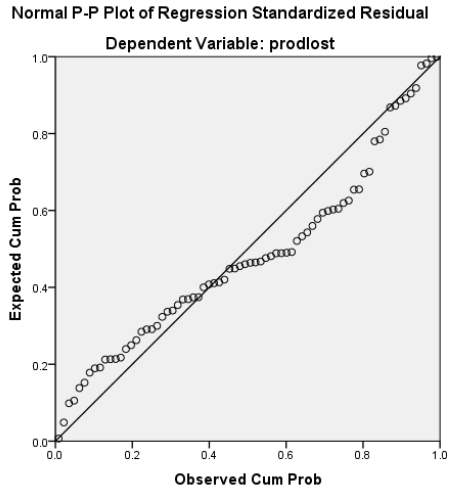
COMPLETE MULTIPLE REGRESSION MODEL, HISTOGRAM, P-P PLOT OF REGRESSION STANDARDIZED RESIDUALS, AND SCATTERPLOT OF PRODUCTIVITY LOSS

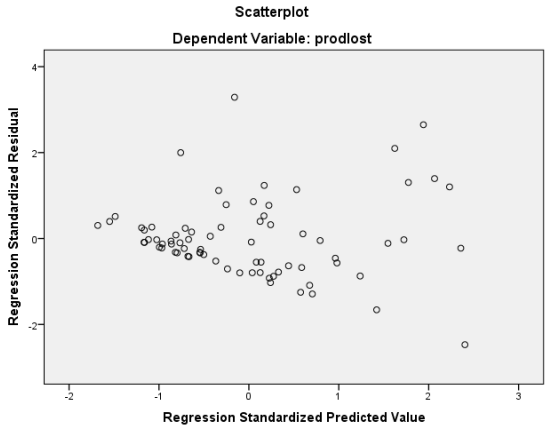
APPENDIX P
WLQ MULTIPLE REGRESSION CHOSEN MODEL 5

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients			R-Square	R-Square Change F-Change	P-Value for R-Squared Change	Model P-Value	Collinearity Statistics	
		B	Std. Error	Beta	t	P-Value.					Tolerance	VIF
1	(Constant)	.022	.009		2.483	.015	.007	.007	.789	.789		
	1=Male 0=Female	.002	.009	.024	.187	.852		.238			.860	1.163
	1=Married 0=Not Married	.006	.011	.070	.546	.587					.860	1.163
2	(Constant)	.024	.012		1.944	.056	.034	.028	.379	.656		
	1=Male 0=Female	.003	.009	.038	.293	.771		.984			.839	1.193
	1=Married 0=Not Married	.003	.011	.030	.227	.821					.813	1.230
	1>=college 0<College	.012	.010	.153	1.208	.231					.869	1.151
	1=Prof 0=ServiceTradeOther	-.011	.011	-.126	-1.014	.314					.903	1.107
3	(Constant)	.006	.016		.365	.716	.084	.050	.168	.415		
	1=Male 0=Female	.005	.009	.066	.508	.613		1.830			.819	1.221
	1=Married 0=Not Married	.003	.011	.034	.264	.792					.805	1.242
	1>=college 0<College	.012	.010	.149	1.182	.241					.864	1.157
	1=Prof 0=ServiceTradeOther	-.013	.011	-.149	-1.200	.234					.888	1.126
	1=500+ 0=under500	-.007	.009	-.096	-.794	.430					.941	1.063
	1=private 0=all other	.023	.013	.206	1.744	.086					.976	1.024
4	(Constant)	-.002	.019		-.097	.923	.099	.015	.586	.526		
	1=Male 0=Female	.004	.009	.060	.451	.654		.538			.790	1.266
	1=Married 0=Not Married	.004	.011	.049	.361	.719					.755	1.325
	1>=college 0<College	.012	.010	.148	1.168	.247					.864	1.157
	1=Prof 0=ServiceTradeOther	-.012	.011	-.142	-1.135	.261					.882	1.134
	1=500+ 0=under500	-.006	.009	-.086	-.707	.482					.928	1.078
	1=private 0=all other	.023	.014	.205	1.712	.092					.965	1.036
	1>=3 0<=2	-.007	.010	-.095	-.672	.504					.692	1.445
	CCollapsedTretment	.012	.012	.138	1.016	.313					.750	1.334
5	(Constant)	.059	.033		1.768	.082	.338	.239	.000	.002		
	1=Male 0=Female	-.002	.009	-.032	-.265	.792		11.357			.725	1.380
	1=Married 0=Not Married	.008	.010	.099	.836	.407					.748	1.337
	1>=college 0<College	.009	.009	.108	.974	.334					.858	1.166
	1=Prof 0=ServiceTradeOther	-.013	.010	-.153	-1.342	.184					.811	1.233
	1=500+ 0=under500	-.003	.008	-.041	-.384	.702					.918	1.089
	1=private 0=all other	.027	.012	.239	2.279	.026					.958	1.044
	1>=3 0<=2	-.007	.009	-.102	-.821	.415					.681	1.469
	CCollapsedTretment	.020	.011	.228	1.899	.062					.729	1.371
	Global health status/QoL	-.001	.000	-.319	-2.613	.011					.704	1.420
	PHQSCORE	.003	.001	.285	2.381	.020					.732	1.366
6	(Constant)	.076	.040		1.903	.062	.344	.007	.434	.003		
	1=Male 0=Female	-.003	.009	-.037	-.307	.760		.621			.722	1.384
	1=Married 0=Not Married	.008	.010	.095	.801	.426					.747	1.339
	1>=college 0<College	.010	.009	.120	1.069	.289					.842	1.187
	1=Prof 0=ServiceTradeOther	-.012	.010	-.143	-1.245	.218					.802	1.248
	1=500+ 0=under500	-.003	.008	-.041	-.378	.706					.918	1.089
	1=private 0=all other	.025	.012	.219	2.023	.047					.905	1.105
	1>=3 0<=2	-.006	.009	-.089	-.711	.480					.670	1.493
	CCollapsedTretment	.018	.011	.210	1.711	.092					.704	1.421
	Global health status/QoL	-.001	.000	-.295	-2.338	.023					.663	1.509
	PHQSCORE	.003	.001	.287	2.386	.020					.732	1.366
	Age at time survey was sent	.000	.001	-.089	-.788	.434					.824	1.214


Histogram
Dependent Variable: prodlost
Mean = 4.82E-16
Std. Dev. = 0.922
N = 74
Frequency
30
20
10
0
-2
0
2
4
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: prodlost
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: prodlost
Regression Standardized Residual
Regression Standardized Predicted Value
4
2
0
-2
-1
0
1
2
3

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