VALUES AND DIET AMONG COLORECTAL CANCER SURVIVORS AND NON-AFFECTED INDIVIDUALS IN NORTH CAROLINA

by
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ABSTRACT

MARLYN ALLICOCK HUDSON: Values and Diet among Colorectal Cancer Survivors and Non-affected
Individuals in North Carolina
(Under the direction of Brenda M. DeVellis, PhD)

Individual core values may be important to understanding and predicting behavioral decisions.

This dissertation, presented in two manuscripts, examined the relationship between values and fruit

and vegetable (FV) intake for colorectal cancer (CRC) survivors and non-affected persons. Hypotheses

were tested using data from the North Carolina Strategies for Improving Diet, Exercise, and Screening

(NC STRIDES) project, a population-based study of CRC risk prevention.

Manuscript One describes the results of logistic regression analyses to evaluate whether

values promote FV intake for 234 participants. Manuscript Two describes the results of case-

comparison techniques to analyze counseling transcripts from 24 participants doing a values self-

confrontation exercise.

Findings include:

Manuscript One: All participants selected *family*, *health*, and *God's will* as the most frequently

endorsed values. Compared to CRC survivors, non-affected persons were more likely to choose the

values *responsibility* and *friendship*. Race, sex, baseline FV intake, and intervention group were not

statistically associated with endorsing a particular value. Being a survivor did not predict selection of

health as a value or selection of value type (instrumental values vs. terminal values). Being a non-

survivor did predict increased FV intake at follow-up. Neither selecting instrumental values nor *health*

predicted increased FV consumption. Selecting instrumental values was not predictive for reporting higher importance or self-efficacy for FV intake.

Manuscript Two: The value *health* functioned to influence diet as: (1) a necessary component for other values, (2) a manifestation of God's will, and (3) a co-requisite value with responsibility for being in good health. Values functioned in both health promoting and limiting ways. For FV adherence, beliefs were more suggestive than categorizing participants based on values, sex, race, and CRC status.

While logistic analyses provided no evidence supporting relationships between values and FV intake, case-comparison analyses underscore that values do influence diet. The values self-confrontation served to raise participants' awareness about their value hierarchies and helped establish how values influence diet choices. Future research should explore ascribed meanings to values in tandem with how values relate to the health behavior of interest. Understanding how and which values influence health behavior practices can impact intervention design for cancer preventive behaviors.

For my mom, Elsie Jupiter, who nurtured my passion for learning.

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Every blade of grass has its angel that bends over it and whispers, "Grow, grow." –The Talmud

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CHAPTER ONE

INTRODUCTION

OVERVIEW

In the United States, there has been an upsurge in the number of persons living two years and beyond after a colorectal cancer diagnosis. More than 10 million Americans are living with a diagnosis of cancer (Rowland et al., 2004) and about 1 million colorectal cancer survivors are in this group (NCI, 2004). This trend is likely to continue given advances in treatment and care and the aging of the population. However, little is known about the health behaviors and needs of this population who have survived an original cancer and now are challenged with preventing other chronic diseases and co-morbidities.

The time around a diagnosis of cancer may represent a "teachable moment" with the potential to trigger health promotion activities that could improve health and decrease the risk of cancer recurrence. In fact, research has shown that cancer survivors have strong intentions to make changes in diet, physical activity, and smoking (Blanchard et al., 2003; Demark-Wahnefried et al., 2000). Thus, research is needed to address the continued health needs of long-term survivors.

A focus on individual values can advance our understanding of the cancer diagnosis as a "teachable moment". Values function as "motivational guideposts" stimulating an increase in value-consistent behavior (Rokeach, 1979). Researchers across a number of disciplines have emphasized the significance of an individual's value priorities for understanding and predicting both behavioral decisions (Rohan, 2000). Personally held values are a crucial part of a person's embodiment and essential to processes of self-regulation, maintenance, and enhancement of self-esteem, and decision-

making (Schwartz, 1994). The cancer experience may redirect cancer survivors to live in more meaningful ways that include a restructuring of values and priorities (Dirksen, 1995; Belec, 1992). Thus, values may be key to understanding how survivors engage in health promoting behaviors (such as healthy diet, physical activity, and regular screening) to prevent CRC recurrence. Theoretical perspectives on values indicate that values may facilitate change by: 1) increasing an individual's sense of the importance of change; 2) helping a person to define their "ideal self" and identifying current behaviors inconsistent with that ideal self; and 3) stimulating motivation for change (Wagner and Sanchez, 2002). Given the significance of core values to influence individual behavior, this dissertation examined the relationship between values and fruit and vegetable intake in two manuscripts.

The first manuscript, which comprises Chapter Five of this dissertation, aims (1) to describe and compare the values and fruit and vegetable consumption of CRC survivors and non-affected persons; and (2) to examine the role of values in promoting fruit and vegetable consumption over time. The second manuscript, which comprises Chapter Six of this dissertation, aims (3) to examine how values function for colorectal cancer survivors and non-affected persons at different levels of fruit and vegetable consumption. To address these aims, data were drawn from three sources: 1) NC STRIDES baseline survey, 2) NC STRIDES follow-up survey, and 3) transcripts from NC STRIDES motivational interviewing telephone calls. The first study relied primarily on quantitative analysis techniques to assess relationships between values and fruit and vegetable consumption. The second study, for the most part, used a qualitative approach for examining how values function in fruit and vegetable consumption. The combination of quantitative and qualitative data collection and analysis techniques in this dissertation was well suited because mixed methods research can clarify, explain, or otherwise more fully elaborate the results (Green et al., 1989). Jointly, the two studies have the ability to increase

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understanding about whether differences in dietary intake can be explained by differences in values and the underlying factors that relate to how values influence behaviors.

In addition to Chapters Five and Six, this dissertation includes a seventh chapter which summarizes the major findings from the two concurrent studies and considers the research implications of these findings. Chapter Seven also discusses the strengths and limitations of the dissertation. In Chapter Two I present background information about colorectal cancer, colorectal cancer survivors, the role of healthy diet in cancer prevention and control, the use of personally held values in health promotion, and motivational interviewing, a counseling approach that includes the use of values. Chapter Two also summarizes how values function as explained by Belief System Theory. Chapter Three presents the conceptual model for values. Chapter Four provides details on the parent study.

CHAPTER TWO

BACKGROUND AND SIGNIFICANCE

Colorectal Cancer

Colorectal cancer continues to be a serious problem in the United States. In 2006 it is

expected that 148,610 adults will be diagnosed and 56,483 persons will die from the disease in the US

(ACS, 2006). Although there has been a slight decrease in incidence of 2.9% per year during 1998-

2001, colorectal cancer remains the second leading cause of cancer deaths among both men and

women (lung cancer is the first) (ACS, 2005). The slight decline, as research suggests, is due to

increased screening and polyp removal which prevents the development of colorectal cancer (ACS,

2005). The lifetime risk of developing the disease is 6% or 1 in 18 (Ries et al., 1998 SEER). Even

though colorectal cancer affects both men and women equally, disparities exist when race is

considered. Overall, African Americans are more likely to develop and die from colorectal cancer than

any other racial or ethnic group (Ries et al., 2004). Colorectal cancer is also significant in terms of its

economic costs, which are estimated at about 5.4 billion dollars annually (Brown et al., 2002).

Colorectal Cancer Survivorship

Advances in screening methods have contributed to increased chances for early detection and

improved the odds of survival. When detected in its earliest stages, there is an 80-90% survival rate

(Jemal et al., 2004; Sandler et al., 2002). There are more than 10 million cancer survivors living in the

US (Rowland et al., 2004) and colorectal cancer survivors accounted for 1 million of this group (NCI, 2004). Indeed, the population of colorectal cancer survivors continues to increase and with this trend there is a pressing need to understand the health promotion needs of this population. Health behaviors important for improved survival, prevention of recurrence, and reduction of risk for other chronic diseases are pertinent to this survivor group (Pinto, et al., 2000). Because cancer survivors are thought to be at increased risk for cancer recurrence (Brown et al, 1993; Hewitt et al., 1999) they could benefit from research aimed at changing health behaviors. Studies have shown that many colorectal, breast, and prostate cancer survivors are interested in making positive changes in diet, physical activity, and smoking cessation (Blanchard et al., 2003; Demark-Wahnefried et al., 2000) and some continue to make positive health behavior changes several years post diagnosis (Patterson et al., 2003). Satia and colleagues (2004) found that colorectal cancer survivors reported significant increases in vegetable intake, physical activity, and supplement use two years post diagnosis. Still, relatively little is known about changes in health behaviors that colorectal cancer survivors make or the determinants of such behavioral changes.

The Role of Diet in Colorectal Cancer Prevention

There is mounting evidence that diet is a strong lifestyle risk factor for colorectal cancer (Riboli & Norat, 2003, Vainio & Bianchini, 2003, Slattery, 2000; Voorrips et al., 2000; Potter, 1999; McMichael & Giles, 1994) and therefore an important area of research. A report issued by the World Cancer Research Fund/American Institute for Cancer Research suggested that 30-40% of cancer cases are preventable by diet (Potter, 1997). Specifically, diets high in vegetables and low in meat may decrease the incidence of colorectal cancer by 66 to 75% (Potter, 1997). Repeated negative associations found between vegetable intake and colorectal cancer suggest that vegetables and, to a lesser extent, fruits have a protective effect (Slattery, 2000; Voorrips et al., 2000; Kolonel et al., 2000; Van't Veer et al.,

2000; La Vecchia & Tavani, 1998; Ness & Powles, 1997; Steinmetz & Potter, 1996; Potter, 1997). The EPIC (European Investigation into Cancer and Nutrition) Study (Riboli & Norat, 2003), a prospective study, found that a fiber intake of approximately 40 grams per day may reduce the risk of colorectal cancer. Additionally, findings from this study suggest that fruit and vegetable consumption is protective against CRC. Further, a recent review of the relation of fruit and vegetable intake to certain cancers concluded that fruit and vegetable consumption may protect against several cancers including CRC (Vainio & Bianchini, 2003). This consensus among nutrition scientists about the importance of fruit and vegetable intake has prompted the National Cancer Institute to promote increased consumption of fruit and vegetables as part of a national campaign (Havas et al., 1994). Additionally, the American Cancer Society's current guidelines recommend that diets for cancer prevention should include five or more servings of a variety of fruit and vegetables daily (Byers, et al., 2002). However, there has been little research to identify the nutritional factors that may influence cancer recurrence. In the absence of data about nutrition and cancer recurrence, Brown and colleagues (2001) have recommended that cancer survivors follow the prevention guidelines provided by the American Cancer Society and other scientific bodies (The American Cancer Society 1996 Advisory Committee on Diet, Nutrition, and Cancer Prevention, 1996; DHHS, 1995; WCRF, 1997; Willet, 1999; Krass et al., 1996). The reasoning is that similar factors indicated in cancer incidence might also be important in promoting cancer recurrence after treatment (Brown et al., 2001). At the time of data collection for the dissertation, guidelines suggested that adults should eat five to nine servings of fruits and vegetables daily. Recently, the US dietary guidelines were updated to suggest that adults should eat between five to thirteen servings each day (USDA, 2005).

Values

Behavior and lifestyle changes are influenced by many factors. One promising area of inquiry is the role of people's value priorities in behavioral decisions (Braithwaite and Scott; 1991; Feather, 1975; Rokeach & Ball-Rockeach, 1989; Rohan, 2000; Wagner and Sanchez, 2002). Values have been described as abstract goals (e.g. freedom, equality) that people consider as important guiding principles in their lives (Braithwaite and Scott, 1991; Feather, 1975, 1990; Rohan, 2000; Rokeach, 1973; Schwartz 1992, 1996). Values sum up the aspirations of both individuals and society and encompass deeply ingrained standards that can determine future directions and justify past action (Braithwaite and Scott, 1991; Kluckhohn, 1951).

Values Classification

Milton Rokeach's (1973, 1979) pioneering and innovative work is pivotal to the study of values. Rokeach (1973, p.5) defined an individual's value as an "enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence". Conceptualizing values as either modes of conduct (*instrumental values* such as helpfulness, honesty, loving) or end states (*terminal values* such as pleasure, wisdom, world peace), Rokeach asserted that one function of values is to motivate. Instrumental values motivate because they symbolize the idealized modes of behavior that are needed to achieve the ideal self. Implied in this conceptualization is the need for the individual's current self-view to be congruent with their values (Boldero and Francis, 2002). Terminal values motivate because they symbolize the desired end states (Austin and Vancouver, 1996).

Although Rokeach's values classification is the most applicable to this proposed study, Boldero and Francis (2002) summarize three other perspectives about classification that are noteworthy. First, several authors (Powers, 1973; Carver and Scheier 1982, 1998; Roberts and Robin, 2000), including

Rokeach (1979), have proposed that values exist within a hierarchy. Within this hierarchical structure values are purported to range from global aspirations to idealized notions of self (Roberts and Robins, 2000) where attainment of higher values are regulated through subordinate values (Carver and Scheier, 1982). However, Rokeach (1979) suggested that while different individuals may hold similar values, each value is assessed by its relative importance in the person's value hierarchy. As such, it is the relative importance of each value for one person compared to another person that may determine how those same values influence behavior. Second, values have been conceptualized as having a regulatory function (Higgins, 1996, Elliot et al., 1997, Carver and Scheier, 1982). The regulatory function is determined by whether the value symbolizes the presence of a positive or negative outcome (Higgins, 1996) or similarly, whether the value is viewed as approaching a desired outcome or avoiding an undesirable outcome (Elliot et al., 1997, Carver and Scheier, 1982). To illustrate, a value that involves a person's hopes, dreams, and wishes (i.e. the ideal self) represents the attainment of positive outcomes and the person has a promotion focus. On the other hand, if the value involves individual duties, obligations, and responsibilities (i.e. the ought self), the value symbolizes the prevention of negative outcomes and the person has a prevention focus (Boldero and Francis, 2002). A third conceptualization of values is to focus on whether values represent the person's own perspective or the viewpoints of significant others (Deci and Ryan, 1991; Higgins, 1999; Rokeach, 1973; Sheldon and Elliot, 1998). The significance of considering values from the standpoint of the self versus that of others has implications for whether behavior motivation occurs intrinsically or extrinsically (Moretti and Higgins, 1999; Sheldon and Elliot, 1998).

This dissertation used Rokeach's classification to explore whether colorectal cancer survivors and non-affected persons consider their values as terminal vs. instrumental in relation to their diet.

Values and Behavior Consistency

Individuals do not always act in a value consistent manner. For example, a person may value their health but may also smoke or eat poorly. To understand how conflicts arise between values and behavior, Maes and Gebhardt (2000) offer an explanation. They defined values as higher order goals that are more distal and abstract. Sub-goals are more concrete and behavioral and move a person towards higher order goals. Conflicts may arise between goals and that conflict may hinder attainment of behavior. For example, the goal of spending time preparing healthy meals may compete with the goal of having more leisure time to relax. Similarly, Rokeach's (1973) conceptualization of values existing within a hierarchy suggests that actualizing one value may mean blocking another (Grube et al., 1994). Therefore, a person regularly has to make choices among values when they express attitudes and behaviors (Grube et al., 1994).

Wagner and Sanchez (2002) also contend that situations may pull individuals to act in opposition to their values. However, while situations can influence behavior, individuals often select situations in which to participate, interpret meanings of the situational context, and make behavioral decisions (Wagner and Sanchez, 2002). Research shows that opportunities for individuals to act in a values-consistent manner are increased when a person: 1) identifies personal values relevant to a situation (Schuman & Johnson, 1976); 2) has well-defined, challenging behavioral goals (Locke and Latham, 1990); 3) has a positive outcome expectancy and high self-efficacy (Bandura, 1986), and: 4) is in a positive mood (Feather, 1992). However, there are situations that diminish congruence between values and values appropriate behavior. These include: 1) lack of recognition of the relevance of values to the behavior (Kristiansen, 1985); 2) failure to realize negative consequences associated with the behavior (Schwartz, 1974); 3) denial of personal responsibility to act in accordance to one's values (Schwartz & Howard, 1980); and 4) the rejection of relevant values by positive role models or the support of relevant values by negative role models (Schwartz and Ames, 1977). Given the multiple

factors that can lead to value-consistent or inconsistent behavior, and the potential conflict between these domains, methods that can highlight consistencies and decrease conflict are needed.

Values Self-Confrontation (VSC)

In general, people are unaware of their value hierarchies. Applying Rokeach's (1973) values self-confrontation method is a way to set and modify priorities and resolve conflicts. Individuals become conscious of their hierarchy through the use of values self-confrontation- -a ranking of values in terms of their importance as guiding principles in their lives. Rokeach's (1973) values self-confrontation method has been applied successfully as an intervention strategy to increase weight loss (Schwartz & Inbar-Saban, 1988), increase seat belt use (Daysprings, 1983), reduce smoking (Convroy, 1979), enhance teaching performance (Greenstein, 1976), and increase financial contributions to, and membership in civil rights organizations (Rokeach, 1973, Rokeach & Cochrane, 1972; Rokeach & McLellan, 1972). The values self-confrontation method is a three-step process. First, individuals use The Rokeach Value Survey, a self-report instrument that has 36 values organized into two categories: 18 instrumental (modes of conduct) values and 18 terminal (desirable end states) values. Individuals rank order these values according to their importance as guiding principles in their lives. Next, participants are provided with information about the rankings of their values compared to those of positive and negative referent groups. Information about an individual's value ranking that is similar to positive referent groups is thought to affirm the individual's ideal self-concept. On the other hand, information that one's value rankings are different from a positive referent group but similar to a negative referent group challenges one's ideal self-concept and leads to dissatisfaction with one's value ranking. Finally, the values self-confrontational method presents individuals with feedback about their own values, attitudes, and behavior that may contradict their own expectations and understanding about their behavior. Similarly, the result is a state of self-dissatisfaction (Grube et al., 1994). It is this

dissatisfaction that directs changes in attitudes and behaviors to make them consistent with the new value ranking (Hamid & Flay, 1974; McLellan, 1974; Rokeach, 1973; Sanders and Atwood, 1979; Sherrid & Beech, 1976).

Another intervention approach using value confrontation is Miller, C'de Baca and Matthews' (1999) expansion of Rokeach's work. These researchers developed The Personal Card Sort for use as a clinical tool to assist clients in exploring their values. The tool includes 72 values. Each value is printed on a business-sized card with a description of the value. Individuals participating in the values exercise are asked to sort each value into one of three categories: 1) Very important to me, 2) Important to me, and, 3) Not important to me. If the category of "Very important to me" includes more than 5 cards individuals do a second sort within this category to pinpoint the top five values. After the top values are selected, participants discuss the meanings of these values, whether their values relate to the health behavior of interest, and what, if any, connection exists between values selected and the health behavior. The outcome of the exercise provides a gauge of an individual's value content, structure, and priorities. Additionally, when associations between values and behavior are identified, it provides an opportunity to encourage the strengthening of participants' commitment to a health behavior goal. Ernst (2002) used the Personal Card Sort to examine the relationship between the values of firefighters and their physical fitness and found that *health* as an important personal value was associated with higher levels of physical fitness. In the present dissertation, an adapted version of the Personal Card Sort was used to explore values in relation to fruit and vegetable consumption in a population of colorectal cancer survivors and non-affected persons.

Values and Belief System Theory

The understanding of how the values self-confrontation method may bring about self-knowledge of values and induce behavior change is grounded in belief system theory. Belief system

theory addresses the relationship between beliefs and behaviors and the conditions that dictate whether belief systems remain stable or change (Rokeach, 1980). The theory suggests that an individual's belief system guides cognitive and motivational processes such as, informational processing, decision making, that then results in behavior change (Rokeach, 1980). The theory views beliefs as interconnected. This interconnectedness operates such that the more central a belief is the more implications it has for other beliefs (Rokeach, 1968). Changing a particular belief will lead to changes in those less central beliefs to which it is functionally related. Thus, changes in a relatively central belief will have a larger impact on the belief system and on behavior than changes in a less central belief (Grube et al., 1994). The theory assumes that beliefs are logical and functionally related. Individuals may not be aware however of how their beliefs are connected or of the consequence that beliefs have for their behaviors (Ball-Rockeach et al., 1984; Rokeach, 1968).

Within belief system theory, values are viewed as single beliefs that transcend objects and situations (Rokeach, 1973). Critical to the definition of values is its distinction from attitudes - a related psychological construct. Attitudes describe evaluations of specific entities (Rohan, 2000; Eagly and Chaiken, 1998). Unlike attitudes, values transcend objects and situations (Rokeach, 1973). Another difference between values and attitudes exists in terms of measurement. Values are rated in terms of their importance as guiding principles in people's lives, whereas scales that reflect the varying degrees of favorability towards an object are used to gauge people's attitudes (Feather, 1990; Maio & Olson, 1998).

Values are a hierarchical and relatively stable, organized systems of beliefs (Rokeach, 1973). Within the belief system framework, certain modes of conduct (instrumental values) are preferable to other modes of conduct and likewise certain end states of existence (terminal values) are preferable to

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other end states of existence (Rockeach, 1973). Belief system theory posits that terminal values are more central than instrumental values and that the two are functionally related (Rokeach, 1973).

Belief system theory also proposes factors that lead to stability or change in belief systems and behaviors. The theory asserts that individuals need to maintain and enhance positive self-conceptions and want to appear as moral and as competent as possible (Ball-Rokeach et al., 1984; Rokeach, 1980). Thus, individuals assess whether their actions measure up to their moral and competent ideals, and if they do, they experience a sense of self-satisfaction. Self-satisfaction enhances the stability of the beliefs and behaviors that initiated it. On the other hand, when individuals are made aware that their actions do not meet their ideal moral and competence criteria, they experience a state of dissatisfaction. It is this dissatisfaction that is hypothesized to serve as a catalyst for change in specific values, attitudes, or behavior (Rokeach, 1973, Grube et al., 1974).

Belief system theory contends that the main mechanism mediating change after values self-confrontation is experiencing a state of dissatisfaction. This hypothesis has been supported by several studies (Grube, 1978; McLellan, 1974; Rokeach, 1973; Sanders and Atwood, 1979, and Sherrid and Beech, 1976). These studies have shown that participants who reported being more dissatisfied after a values self-confrontation exercise showed greater behavioral changes. In fact, significant behavior change has been reported in half of the 16 published applications using values self-confrontation (Schwartz and Inbar-Saban, 1988). According to Rokeach and Grube (1985) a majority of studies, many unpublished, using a VSC approach have evaluated whether enduring changes occurred. Grube and colleagues (1994) suggest reasons for the dearth of publications and lack of new research in belief system theory and values self-confrontation. One reason may be that traditional mainstream social psychology focuses on attitudes rather than values. Another reason may be that researchers are skeptical about one brief, values self-confrontation inducing significant and lasting changes.

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Nonetheless, successful applications of values self-confrontation have included smoking reduction (Conroy, 1979), weight loss (Schwartz and Inbar-Saban, 1988), increased financial contributions to and membership in civil rights organizations (Rokeack, 1973), and enhanced pro-environment behavior (Ball-Rokeach et al., 1984). All-around these findings show support for belief system theory and the effectiveness of using values self-confrontation.

The primary contention of belief system theory is that the main psychological mechanism responsible for change after values self-confrontation is a state of dissatisfaction focused on specific values (Grube et al., 1994). However, Sawa and Sawa (2001) argue that there may be other mechanisms that determine the degree of the induced dissatisfaction that warrant consideration. Sawa and Sawa (2001) propose that whether dissatisfaction following a values assessment exercise induces health behavior change depends on three conditions: salience, dissatisfaction with current behavior, and degree of inconsistency between current behavior and beliefs about ideal level of behavior. First, the salience of *health* as a value refers to whether *health* is identified as important within an individual's value system. Behavior changes are hypothesized to occur only if the value being challenged as inconsistent with behavior is salient within a person's value system. Second, the level of dissatisfaction that occurs as a result of the values self-confrontation is important. Even though individuals may recognize inconsistencies between their values and behavior, they may not experience sufficient dissatisfaction with their current behavior to motivate a behavior change to resolve the inconsistency. A final condition relates to beliefs about current behavior as compared with beliefs about the ideal level of behavior. Even though individuals experience dissatisfaction due to the inconsistencies between their behaviors and values, the inconsistency between the ideal and current behavior may be too small to require any behavior change. Clarifying these relationships may provide relevant information about fruit and vegetable consumption among colorectal cancer survivors and suggest ways to intervene for

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health promoting behaviors. This dissertation explored how these three factors relate to values associated with fruit and vegetable consumption in colorectal cancer survivors and non-affected persons.

Values and Motivational Interviewing

One way of operationalizing the values self-confrontational method is within motivational interviewing. Motivational interviewing is a counseling technique that was first used to address addictive behaviors. Recently there has been an interest in applying this technique to a variety of health related behaviors such as diet, physical activity, screening, diabetes self-management, and pain management (Resnicow et al., 2002; Taplin et al., 2000, Smith et al., 1997, Stott et al., 1995). Developed by Miller (1983) and expanded by Miller and Rollnick (1991), motivational interviewing, is a counseling strategy grounded in Carl Rogers' (1964) theory of the critical conditions for change.

Motivational interviewing embodies a client-centered approach where the focus of the counselor is on listening and reflecting to help the clients find solutions that fit their goals and lifestyle. Motivational interviewing considers the individual's stage of readiness to change, appraises and seeks to build individual motivation for change, and draws out ambivalence about making a behavioral change. The counselor's goal is to create a nonjudgmental and supportive environment where clients are free to articulate reasons for both their motivation and reluctance to change. To ensure that the encounter is truly client centered, motivational interviewing counselors rely on the strategies of (a) reflective listening as opposed to direct confrontation, persuasion or advice giving, and (b) pointing out discrepancies between clients' current and desired behaviors. In addition to using these skills to understand the client's viewpoint, motivational interviewing focuses on eliciting 'change talk' (e.g. commitment language about changes) from the client, and 'developing discrepancy' (calling attention to discrepancies between a person's current behavior and values) (Rollnick and Miller, 2002).

Motivational interviewing is appropriate for focusing on values because the defining principle of motivational interviewing is a self-directed, person-centered approach. Wagner and Sanchez (2002) suggest that motivational interviewing helps individuals define their current and ideal self and strive towards that ideal self. Accordingly, emphasizing values in motivational interviewing may help increase the individual's sense of the importance of change and define the kind of change that is needed. Values within the context of motivational interviewing can serve to: 1) help individuals define their ideal self; 2) stimulate motivation for change by focusing on discrepancies between the actual versus ideal self; 3) reduce ambivalence about behavior change, and 4) increase confidence in the ability to change. To date, efforts to incorporate values into motivational interviewing has yielded positive empirical findings (Moe et al., 2002; Resnicow et al., 2002a, 2002b, 2001).

Because motivational interviewing can be time intensive and may require trained professionals in psychology and counseling, brief adaptations of motivational interviewing are used in medical and public health settings (Resnicow et al., 2002b). Brief motivational interviewing focuses on the "spirit" of motivational interviewing such as respecting the client through listening well and trying to understand the client's viewpoint (Rollnick, Allison, et al., 2002). The goal of brief motivational interviewing is to help the client talk through the "why and how" of change and the counselor's task is to understand the person's feelings and any plans they have for changing behavior. In brief motivational interviewing the counselor is focused on using listening skills to understand the client's viewpoint but may not directly focus on eliciting change talk and developing discrepancy (Rollnick, Allison, et al., 2002). The present dissertation employed brief motivational interviewing.

Studies using brief motivational interviewing interventions to promote changes in diet and diet-related behaviors have been promising. Smith and colleagues (1997), in a pilot study with overweight, diabetic women, found that the women in the motivational interviewing study arm showed better glycemic control and turned in more diet and activity diaries than women in the standard intervention

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arm. Berg-Smith and others' (1999) Dietary Intervention Study in Children added a motivational interviewing component after 3 years of a dietary intervention that had yielded positive findings. The addition of motivational interviewing resulted in reduced calories from fat and dietary cholesterol and high adolescent satisfaction with the motivational interviewing. Resnicow and colleagues' (2000) work with African American church-based populations to increase fruit and vegetable consumption showed significant increases in fruit and vegetable consumption for those in the motivational interviewing groups. However, work by Mhurchu and colleagues (1998) using motivational interviewing versus a standard dietary intervention for patients with hyperlipidemia, showed no significant between-group differences for any of the main outcomes. One possible explanation for null findings is poor motivational interviewing technique (Resnicow et al., 2002).

In addition brief motivational interviewing directed towards achieving nutritional goals is client focused and can support individuals in articulating a variety of desires and needs. Individuals can express how personally important dietary change is, as opposed to how important the counselor or nutritionist may think it is. Additionally, individuals can discuss potential barriers to making diet changes, suggest changes that might work for them, and envision ways to increase their chances of success in achieving dietary goals.

Values Confrontation in Motivational Interviewing

Increasingly, values are being used in brief motivational interviewing interventions (Wagner and Sanchez, 2002; motivationalinterview.org). Counselors use values lists or card sorts to: 1) help individuals discuss meanings of value statements, 2) evaluate the consistency between values and behavior, 3) assess perceived barriers to and opportunities for increasing value-behavior consistency, and 4) evaluate the role of health behaviors in achieving or preventing consistency. Focusing on individuals' core values is considered a useful tool as values may stimulate motivation for change and

serve to increase participant engagement (Sanchez, 2000). However, to date there are few published reports of values used in conjunction with motivational interviewing to promote behavior change. As mentioned earlier, Ernst (2002) studied the influence of values on physical activity among firefighters and found that the value, *health,* was a predictor of physical activity. De Francesco (2001) reviewed the use of the card sort to focus on physical activity and dietary behaviors in the same population of firefighters that Ernst (2002) examined. De Francesco (2001) found that a values focus was useful in resolving ambivalence about behavior change and increasing motivation by helping firefighters to link their behavioral goals with their own values. Sanchez (2000) used a values card sort with alcohol abusers and compared findings with a control group. The values group had better outcomes on measures of drinking behavior and knowledge about consequences at 3-month and 6-month follow-up. Additionally, Sanchez (2000) observed that incorporating values increased the ease of motivational interviewing by creating a more egalitarian dialog, encouraging participants' expression of their knowledge, concerns, beliefs to drive the conversation, as well as to promote participant engagement.

In sum, including a focus on values in motivational interviewing fits well with the client-centered philosophy of the counseling method. And allows for exploring ways current behavior is inconsistent with important values and understand how the discrepancy developed may promote behavior changes.

CHAPTER THREE

CONCEPTUAL FRAMEWORK

The conceptual model presented in Figure 1 draws primarily on the theory described in the

preceding section. Additionally, individual motivation, considered as an important element for predicting

behavior change in motivational interviewing, is incorporated. This model describes how values

identified in a motivational interviewing encounter are related to colorectal cancer preventive behavior.

During a values self-confrontation exercise, individuals identify values that are guiding principles in their

lives. The values self-confrontation then initiates a series of psychological processes that influence

behavior. One such process is for individuals to classify the values selected as either instrumental

(modes of conduct) or terminal (end states). Instrumental values may motivate because they represent

idealized approaches to behavior for an individual to realize their ideal self. Terminal values may

motivate because they represent the desired end states that individuals seek to achieve (Austin and

Vancouver, 1996). The categorization of values as either instrumental or terminal if related to the

behavior under study then influences behavior change.

A second result of the values self-confrontation is that individuals are made aware of whether

their values are consistent with their related behaviors. Rokeach (1980) argued that individuals want to

maintain positive self-assessments and that when discrepancies occur between their values and their

behavior, dissatisfaction results. To resolve dissatisfaction, behavior change can occur. However,

Sawa and Sawa (2001) added that level of self-dissatisfaction needed to influence health behavior

change is contingent upon *health* as a salient value within the individual's value system, the level of dissatisfaction an individual experiences with the current health behavior, and the degree of inconsistency between the individual's ideal health behavior and their current behavior. It is these three factors that determine whether health behaviors are influenced.

An additional factor to account for is individual level of motivation for behavior change. In motivational interviewing the contention is that a focus on values may resolve ambivalence about change and stimulate motivation for change. Focusing on the discrepancy between values and actual behavior may cause individuals to "recalibrate" their behavior to match their values (Miller and Rollnick, 2002). As such, to facilitate behavior change in motivational interviewing, assessing individual level motivation and building motivation for change through a value confrontation exercise is useful. Miller and Rollnick (2002) suggest that an individual's level of motivation for change figures prominently as a good predictor of outcome.

I, therefore, included individual level motivation as a mediator of the relationship between the level of self-satisfaction/dissatisfaction and fruit and vegetable consumption. According to Miller and Rollnick (2002), importance of change and confidence for change are two indicators of intrinsic motivation for behavior change. First, "the extent to which an individual wants, desires, or wills change" (Miller and Rollnick, 2002, p.10) refers to the perceived importance of a particular change. A low level of perceived importance is sometimes viewed as being "resistant" or "in denial" about behavior change. Low perceived importance might also suggest insufficient discrepancy between current and ideal self so change is not required.

The second indicator of an individual's level of motivation is confidence for change, self-efficacy. Notice that a person may be willing but not be able to change. Or, a person may feel confident about changing but not agree that the change is important. However, if a person feels change is important and believes that they can do the required action then the likelihood of pursuing change is

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high. Thus, the conceptual model incorporates individual motivation as a mediator of fruit and vegetable intake.

In sum, the model shows how a values self-confrontation exercise is theorized to create a state of dissatisfaction that in turn may induce changes in fruit and vegetable intake. Included are underlying factors suggested to influence the degree of dissatisfaction. Finally, how dissatisfaction induces behavior change may be mediated by factors relevant to individual motivation. A greater understanding of how these variables influence each other could furnish needed information about promoting increased fruit and vegetable consumption for colorectal cancer survivors and suggest ways to guide future interventions.

Figure 1: Conceptual Model of Values Self-Confrontation

Value Self-Confrontation

Values Classification	Psychological Consequences	Psychosocial Factors	Health Behavior	Health Outcome

Values (Identification)

- Instrumental
- Terminal

- Value Consistency Recognition

- Value Discrepancy Recognition

Self-Satisfaction

- Salience of health as a value
- Dissatisfaction with current f/v intake
- Inconsistency between ideal f/v intake vs. current f/v intake

Self-Dissatisfaction

Motivation

Importance

Confidence

Fruit and vegetable intake

CRC prevention & decreased CRC recurrence

Note:
- Black circle represents relationships not explored in this dissertation
- F/V=Fruit and vegetable

CHAPTER FOUR: PARENT STUDY

Dissertation Study Overview

The goal of this dissertation study was to examine the influence of individual values on fruit and vegetable consumption of colorectal cancer survivors and non-affected persons. This dissertation research was a secondary analysis of data obtained from the North Carolina Strategies for Improving Diet, Exercise, and Screening (NC STRIDES, PI: Marci Kramish Campbell), a population-based study of colorectal cancer risk prevention in a 33-county area of North Carolina. Participants in the NC STRIDES study were originally recruited from the North Carolina Colon Cancer Study (NCCCS). A detailed description of the NCCCS study can be found elsewhere (Satia et al., 2004).

The dissertation study was conducted using quantitative and qualitative approaches for descriptive/interpretive and explanatory purposes. Paper One assessed the relationships between values and fruit and vegetable consumption for colorectal cancer survivors and non-affected persons. Specifically, the baseline and follow-up data were used to (1) examine socio-demographic factors associated with values and fruit and vegetable intake, (2) assess the role of values in fruit and vegetable changes over time, and (3) assess the role of values in other psychosocial changes (individual motivation). Paper Two used a purposeful stratified sampling approach to examine in greater detail the relationships presented in the conceptual model. Specifically, the purpose of using qualitative data in this study was to expand the examination of how values may operate in promoting changes in fruit and vegetable consumption. Jointly, the two approaches contribute to public health practice by: (1) providing information about whether dietary intake can be explained by differences in values and the underlying factors that relate to how values influence behaviors; (2) adding to the

scholarship on the use of motivational interviewing for health promotion; and (3) improving future colorectal cancer control and prevention interventions that use a values approach as a health communications tool. Approval for this dissertation study was obtained from the Institutional Review Board of the School of Public Health at the University of North Carolina at Chapel Hill.

Parent Study Population

A total of 835 participants were randomized to one of the following year-long interventions: (1) four tailored print materials (TPCs only); (2) four tailored motivational interviews (TMI only); (3) four tailored print materials and four motivational interviews (COMBINED); and (4) general health information materials (CONTROL). NC STRIDES participants completed all surveys via the telephone: a baseline survey and a follow-up survey (after 12 months). At follow-up, 735 participants completed the study (90% completion rate). Because personally held values were only assessed in the Tailored Motivational Interviewing (TMI) arms of the NC STRIDES study population (N =366), the sample of interest for this dissertation study was restricted to participants in the TMI groups (TMI only and COMBINED). In addition to receiving the baseline and follow-up surveys, participants randomized into the TMI arms received four motivational interviewing counseling calls approximately 20-30 minutes long. Two months after the baseline study was conducted, participants received the first call. The second, third, and fourth calls occurred during months 4, 6, and 9 respectively.

Motivational Interviewing (MI) calls

The motivational interviewing calls were conducted via the telephone. Telephone counselors were doctoral students at UNC School of Public Health trained in motivational interviewing. Following the training, interviewers conducted practice interviews with participants not enrolled in the current study and these were audio-taped and reviewed for adherence to the protocol. The project manager supervised the telephone counselors and monitored the calling on an ongoing basis to ensure quality.

Participants received four motivational interviewing calls lasting about 20-30 minutes. Only one call focused on fruit and vegetable consumption.

Motivational interviewing is client-centered and uses skills such as listening and reflecting to help the participant find a solution that fits with their own goals and lifestyle. However, being client-centered does not mean that the topic of conversation is random. Rather, being client-centered ensures that the participant's concerns, fears, knowledge, and motivations direct the conversation and that the participant determines what changes, if any, will occur. As such, the telephone interviewers used a "roadmap" developed by the NC STRIDES staff. The roadmap is shown in Figure 2. It allowed for support of participants in articulating the importance of dietary change, barriers to making changes, a plan of action, and factors that may increase the participant's chances of succeeding in any nutrition goal set. The "roadmap" also balanced the need to control costs and maintain quality in using brief telephone-base motivational interviewing in a randomized control trial. This protocol allowed for standardization and flexibility to incorporate the reflective listening, open-ended questions, and client-led discussion that are the hallmarks of motivational interviewing. The script blended the vocabulary and techniques of motivational interviewing with the needs of the NC STRIDES research objectives of addressing the health behaviors under study.

All motivational interviews were taped recorded with the permission of participants. A random sample of these tapes was monitored by the project manager for consistency, appropriateness of probing, relevant interviewing attributes, and adherence to spirit of motivational interviewing. These steps were in place to identify and control for any potential threats to internal validity (Pedhazur & Schmelkin, 1991).

The structured section of the values inquiry during the motivational interviewing calls is provided in Table 1 below. Table 2 provides the list of values used during the values clarification exercise. Figure 3 shows the fruit/vegetable importance and confidence scale.

Figure 2. NC STRIDES Roadmap Protocol for the Tailored Motivational Interviewing Call

INTRODUCTION

- Identify project
- Indicate when they did survey
- Check they received phone card
- Remind of letter/4 calls
- ASK PERMISSION TO TAPE RECORD

SET THE STAGE

- Disclaimer: we are invested in the value of these behaviors but decision to change is yours alone
- Check if topic is still OK
- Give feedback for this behavior
- Get participant at ease/talking
- Try to focus this talk on behavior topic
- Listen, reflect

FEEDBACK

- Give behavior recommendation here or elsewhere
- "What do you think of these?"
- Listen, reflect

VALUES
- Research basis for interest
- Permission to talk about these
- Expand from value words to "Tell me more about what these mean to you"
- Listen well, reflect
- Connect to behavior change? "Thinking about these is there any connection between them and _____?"
- Reflect connection or lack of connection

RATE IMPORTANCE AND CONFIDENCE

- Scale of 1 to 10 *or* pros and cons of change
- Listen well, reflect, paying close attention to ambivalence expressed

ELICIT THOUGHTS AND FEELINGS

- "We have discussed a lot of things today. What stands out to you?"

CLOSING

- Summarize briefly including:
- Ambivalent feelings
- Importance
- Plan
- Confidence in plan
- Affirm where appropriate
- Discuss follow up in call 2
- Close

Table 1. Values Clarification during the Motivational Interviewing Call

VALUES

If it's all right with you, I'd like to switch gears for a minute and talk about the values you feel guide your life. Other studies have found that it becomes easier for people to make changes like <u>eating more fruits and vegetables</u> when the change relates to the person's own value system. Would it be OK to talk about this?

➢ Recently we sent you a sheet with about 20 words on it. Is that sheet nearby so you could look at it?
➢ If no: would it be OK if I read them to you? If ok, just stop me when you feel that a word is very, very important in how you try to live your life… Let's aim at finding three words like that…..If not ok, move on to next section…..
➢ If yes: Would you like me to read them to you or do you want to look them over yourself and then share with me which three are the ones you feel are most important to you in your life?
➢ If difficulty choosing: You may also choose any value that is important to you but not listed.
➢ **Listen Well/Allow pauses/Reflect--Using open-ended questions and reflective listening as much as possible—Remember: be non-judgmental and avoid leading the person to associate any of the choices with making change**
    ➢ "So _____, _____, and _____ are the values you feel are most important to you. Is that right or would you change any of these?"
    ➢ "Why don't you tell me about these. What do they mean to you? Why are they important to you?"
    ➢ "I'm wondering how, if at all <u>fruits and vegetables</u> fit into this picture?"
    ➢ "You've indicated that _____ is very important to you. How does this effect your decisions about <u>eating fruits and vegetables?</u>"

RATING IMPORTANCE/CONFIDENCE

➢ **If behavior has been described as important in earlier conversation:** "I think I have a good idea of the importance of <u>fruits and vegetables</u> to you, but I'd like to be sure.
➢ On a scale of 1 to 10 with 1 being not important at all and 10 being very, very important how would you rate the importance of <u>eating more fruits/vegetables</u>?
➢ I'm curious. What made you decide on _____ instead of ____ (choose a # 1-2 steps below the one chosen)?
➢ So _____ makes <u>fruits/vegetables</u> have greater importance to you. What would it take to make <u>fruits/vegetables</u> move up in importance, say from ___ to a ____ (a # 1-2 steps above the # chosen)?
➢ (If response is "I'd have to get sick…" reflect back along the lines of "So, it would have to get pretty bad before <u>fruits/vegetables</u> would become more important…")
➢ It sounds like _____ and _____ would increase the importance of doing this for you? Are there ways you can think of that this could happen?"
➢ **NOTE:** If individual can't do the rating from one to ten easily: "Instead of doing that why don't you just tell me what some of the pros and cons would be in making this change…" "What do you like/dislike about eating <u>fruits and vegetables</u>" "What are the advantages/disadvantages of <u>eating fruits/vegetables</u>" "why would you want to/not want to eat more <u>fruits/vegetables</u>"
➢ **Listen well/allow pauses/explore ambivalence/reflect back on what makes this important and what plan could evolve to increase importance ….does that sound about right?**
➢ "Thinking about doing _____, on a scale of 1 to 10 with 1 being not sure at all and 10 being very, very sure how would you rate your confidence in <u>eating more fruits/vegetables?</u>
➢ What made you decide on _____ instead of ____ (choose a # 1-2 steps below the one chosen)?
➢ So _____ makes _____ you feel more certain that you could do this.
➢ What would have to happen to make you feel even more sure that you could do this, say take you from that ___ to a ____ (a # 1-2 steps above the # chosen)?
It sounds like _____ and _____ would increase your certainty of doing this. Are there ways you can think of that this could happen?"

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Table 2. List of Values

VALUES
*Responsibility***,** to do what I said I would do
Purpose, to have meaning and direction in my life
*Helpfulness***,** to reach out to others
*Inner peace***,** to find a sense of quiet/calmness
*Justice***,** to promote fair and equal treatment for all
Hope, to see what happens in life in a positive way
*Independence***,** to be able to meet my own needs
God's will, to follow God's plan for me
Loving, to give and receive
Family, to have a happy, loving family
Spirituality, to grow and mature spiritually
Forgiveness, to be forgiving of others
Strength, to be physically fit and capable
*Mental Strength***,** to be mentally alert
Humor, to see the funny side of life
Friendship, to have close, supportive friends
Growth, to keep changing and growing
Health, to be physically well
*Other*_____

Figure 3. Importance and Confidence Scale

IMPORTANCE OF:
EATING MORE FRUITS AND VEGETABLES

NOT AT ALL					SOME WHAT					VERY VERY
0	1	2	3	4	5	6	7	8	9	10

MY CONFIDENCE IN:
EATING MORE FRUITS AND VEGETABLES

NOT AT ALL					SOME WHAT					VERY VERY
0	1	2	3	4	5	6	7	8	9	10

CHAPTER FIVE: PAPER ONE

Do Values Matter? Assessing the relationship between values and fruit and vegetable Intake.

Introduction

Many researchers and theorists have drawn attention to the importance of an individual's value priorities in understanding and predicting attitudinal and behavioral decisions. Milton Rokeach's (1973, 1979) pioneering and innovative work is pivotal to the study of values. Rokeach (1973, p.5) defined an individual's value as an "enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence". Conceptualizing values as either modes of conduct (*instrumental values* such as helpfulness, honesty, loving) or end states (*terminal values* such as pleasure, wisdom, world peace), Rokeach asserted that one function of values is to motivate behavior. Instrumental values motivate because they symbolize the idealized modes of behavior that are needed to achieve the ideal self. Terminal values motivate because they symbolize the desired end states (Austin and Vancouver, 1996).

Several authors (Powers, 1973; Carver and Scheier 1982, 1998; Roberts and Robin, 2000), including Rokeach (1979), have proposed that values exist within a hierarchy. Rokeach (1979) suggested that while different individuals may hold similar values, each value is evaluated by its relative importance in the person's value hierarchy. As such, it is the relative importance of each value for one person compared to another person that may determine how those same values influence behavior. In general, people are unaware of their value hierarchies. Applying Rokeach's (1973) values self-confrontation method is a way to set and modify priorities and resolve conflicts. Miller, C'de Baca and Matthews' (1999) Personal Card Sort has also been applied to explore individual values. The latter

method has been employed in during motivational interviewing in relation to health behavior change. For example, Ernst (2002) used the Personal Card Sort to examine the relationship between the values of firefighters and their physical fitness and found that *health* as an important personal value was associated with higher levels of physical fitness. There is a growing body of studies that have used motivational interviewing interventions to promote changes in diet. However, to date there are no studies that explore personally-held values and dietary intake for colorectal cancer survivors.

The aims of this study were to: (1) describe and compare the values and fruit and vegetable consumption of CRC survivors and non-affected persons and (2) examine the role of values in promoting changes in fruit and vegetable consumption over time.

Research Questions/Hypotheses

Through the following research questions and hypotheses, this study was concerned with identifying the relationships among personally-held values and fruit and vegetable intake:

1. What were the values selected by CRC survivors as compared with non-affected persons across the different fruit and vegetable consumption categories (above 5 servings and below 5 servings)?

> *Hypothesis$_{1a}$:* Regardless of the level of fruit/vegetable consumption, CRC survivors will be more likely to select *health* as a value than non-affected persons.

> *Hypothesis$_{1b}$:* Regardless of the level of fruit/vegetable consumption, CRC survivors will be more likely to select instrumental values rather than terminal values compared to non-affected persons.

2. What were the value categorizations of those who report an increase in fruit and vegetable consumption?

> *Hypothesis*: Participants who selected instrumental rather than terminal values will be more likely to report an increase in fruit/vegetable consumption at follow-up.

3. Did participants who identified *health* as a value report more change in their levels of fruit and vegetable consumption at follow-up?

> *Hypothesis*: Participants who selected *health* as a value will be more likely to increase fruit and vegetable consumption at follow-up than those who did not select health as a value?

4. What values were associated with higher levels of importance of eating more fruits and vegetables?

> *Hypothesis*: Participants who selected instrumental rather than terminal values will be more likely to report higher levels of importance for fruit/vegetable intake.

5. What values were associated with higher levels of self-efficacy to consume more fruits and vegetables?

> *Hypothesis*: Participants who selected instrumental rather than terminal values will be more likely to report higher levels of self-efficacy for fruit and vegetable intake.

Methods

Data Collection

This study examined data collected as part of a colorectal cancer prevention study with 4 intervention arms: (1) Tailored Print Communication (TPC) Only, (2) Tailored Motivational Interviewing (TMI) Only, and (3) TPC and TMI (Combined), (4) Control. However, this study analyzed data from two of the intervention conditions (TMI only and Combined).

Data for the present study were obtained from baseline and 1-year follow-up surveys collected via telephone and audio-taped TMI calls. The baseline survey interviews lasted about 45 minutes and assessed demographic characteristics, health measures, behavioral measures (diet, physical activity, colorectal cancer screening), and cognitive and psychosocial measures. Participants completed a second telephone survey one year after baseline. The follow-up survey was the same length as the baseline one (45 minutes) and asked about the same health, behavioral, and psychosocial issues as

was done in the baseline survey. The only difference from the baseline measures collected was an additional set of process evaluation questions.

In addition to receiving the baseline and follow-up surveys, participants randomized to the TMI arms received four motivational interviewing counseling calls approximately 20-30 minutes long. TMI calls focused on fruit and vegetable intake, physical activity, colorectal cancer screening and a wrap-up call. During the baseline survey, participants indicated the behavior each TMI call should focus on. For this study, data pertaining to values were obtained from the audio-taped, TMI counseling calls during the intervention period that focused on fruit and vegetable intake. Two months after the baseline study was conducted, participants received the first call. The second, third, and fourth calls occurred during months 4, 6, and 9 respectively. Both groups also received small incentives to participate.

Study Sample

Hypotheses were tested using data from the NC STRIDES study. Data were originally obtained from 735 persons in the parent study. However, the analytic sample for this study was smaller because: (1) only participants receiving the Tailored Motivational interviewing intervention (TMI only intervention and COMBINED intervention) were of interest, and (2) only 234 participants receiving the TMI interventions had complete data for all study variables of interest. Individuals were excluded if they did not complete both baseline and follow-up surveys, did not have a counseling call focused on fruit and vegetable intake, or did not complete the values, fruit and vegetable importance, and fruit and vegetable confidence ratings as part of the TMI call. Figure 4 shows the sample selected for the study.

Measures

Fruit and Vegetable Intake

Average daily fruit and vegetable consumption was measured using a 36-item modified Block Food Frequency Questionnaire validated in a southern population by Resnicow and colleagues (2000).

The foods that were part of the 36-item questionnaire included only fruits and vegetables. The question regarding French-fry consumption was deleted leaving 35 items. Resnicow's instrument was then slightly modified for the NC STRIDES study by asking how often foods were consumed in the past month rather than the past week. Additionally, two questions asked about the number of vegetables and/or vegetable juices (6oz) and fruit and/or fruit juices (6oz) consumed in a single day with responses ranging from 0 to more than 5. Survey selections for fruit and vegetables were added to obtain combined totals.

Socio-demographic Characteristics

Data on age (years), race (Black, White), sex (male, female), and colon cancer case status (yes, no) were collected only in the North Carolina Colon Cancer Study. Additional information was collected on the NC STRIDES baseline survey for the following variables: education (eighth grade or less, some high school, high school graduate or GED, trade or beauty school graduate, some college, college graduate, more than college/some post graduate or professional degree), income (less than $10,000, $10,00 to $19,999, $20,000 to $29,999, $30,000 to $49,999, $50,000 to $74,999, and $75,000 or more), and employment status (yes/no).

Values

Personally held values were assessed during the first and third motivational interviewing calls. During the structured part of the motivational interviewing survey (described in detail in Table 1) participants selected their top three values (guiding principles in one's life) from a list of 18 values. The list of values used was a modified version of the Miller, C'de Baca, & Matthews' (1999) Personal Values Card sort (described earlier on page 11). The tool of 72 values was reduced to eighteen values by the NC STRIDES staff based on formative research. Participants were given the option to choose values other than the 18 used in the study and listed in Table 2.

Values were by value type, that is, whether they were terminal (yes/no) or instrumental (yes/no) values. To address questions 2, 4, and 5, categorization of individual values as terminal and instrumental dimensions was required. Only six of the eighteen values, modified from Miller, C'de Baca, & Matthews' (1999) Personal Values Card sort, were similar to those used in Rokeach's (1973) classification. Therefore, an expert panel of faculty, graduate students, and professionals with experience using the Values Card sort and/or familiarity with values research, were surveyed to arrive at a consensus for classification. For each of the 18 values, the panel was asked, "Is this value likely to be considered a) instrumental (a preferred mode of conduct) or b) terminal (a desired end state of existence)? Raters were able to select "instrumental", "terminal", "both terminal and instrumental". Results were tabulated to determine frequencies.

Fruit and Vegetable Importance and Confidence

The importance of eating more fruit and vegetables was assessed during the TMI counseling call using a scale of 0-10, where 0=not at all important and 10=very, very important. Similarly, individual confidence (self-efficacy) for eating more fruits and vegetables than their current intake was measured during the TMI calls. The scale ranged from 0-10 where 0= not at all confident and 10= very, very confident.

DATA ANALYSIS

Analyses were conducted using SPSS Version 13.0 (SPSS Inc., Chicago, IL). For all study variables, univariate analyses were completed to assess variable distributions (e.g. characterized by mean, median, mode, standard deviation, missing data, and out-of-range values). Raw frequencies and percentages were generated to describe the sample in terms of values, value type, demographic characteristics, and fruit and vegetable servings. Cross tabulations were performed on categorical data to compare demographic characteristics (case status, sex, age, race, intervention group) and individual

values, fruit and vegetable intake levels, fruit and vegetable importance level, and fruit and vegetable self-efficacy level. A series of t-tests compared the baseline mean fruit and vegetable intake level of men and women, CRC survivors and non-affected individuals, and African Americans and Whites. A Pearson's correlation matrix was generated to assess the strength of the correlations among the 18 values. This procedure was done to determine whether factor analysis would be an appropriate step for reducing the number of values being analyzed. Logistic regression analyses were conducted on categorical data for questions 1 to 4 to assess whether the independent variable of interest was statistically predictive of the dependent variable of interest beyond the effects of the demographic (independent) variables. Multiple regression was performed to analyze question 5 where the dependent variable was continuous. Analytical procedures were used to control for the influence of variables that could potentially confound these relationships (e.g. race, age, sex, case status, and intervention group).

RESULTS

The following section presents results pertaining to the sample characteristics and by study hypotheses.

Quantitative Sample Characteristics

Quantitative analyses were performed for the 234 participants who completed the baseline survey and 12-month follow-up survey, and received a TMI call about fruits and vegetables during the intervention period, Figure 4. The analytic sample for this study is smaller than the original NC STRIDES sample because of participants not receiving the fruit –vegetable motivational interviewing call (N=41) and missing variables for top values selected, fruit and vegetable importance, and fruit and vegetable confidence (N=91) as indicated in Figure 4. Additionally, 27 participants did not do the values

rating but were retained as part of the study sample (N=234) because they completed the importance and confidence ratings for fruit-vegetable intake during the motivational interviewing call.

As shown in Table 3, the final sample (N=234) was made up of participants with a mean age of 67, 22% had a high school diploma or GED, 28% had a college degree or more, and a majority (65%) were married. There were 85 African Americans (36%) and 149 Whites, 76 (33%) were colorectal cancer survivors and 158 (68%) were non-affected. There were equal numbers of male and female participants and almost equal numbers in each of the intervention groups. The average fruit and vegetable daily intake was 5.6 servings at baseline and 6.2 at follow-up. Chi-square analyses were conducted to compare whether the proportion of CRC survivors and the proportion of CRC non-affected individuals differed by race, sex, income, education, age, martial status, and baseline fruit and vegetable intake. As Table 4 shows, there were no statistically significant differences between the two groups for these above named characteristics except for intervention group (χ^2_{1df} =3.99, p=<.04).

Figure 4: Study Sample

NCCCS Study Participants
(N=1691)

Enrollment of colorectal
cancer survivor cases and
general population
individuals (N= 735)

Randomization

TPC only
(N=181)

TMI only
(N=185)

TPC + TMI
(COMBINED)
(N=181)

CONTROL
(N=188)

N=366

41   No FV tape/call

91   No values & ratings

N=234
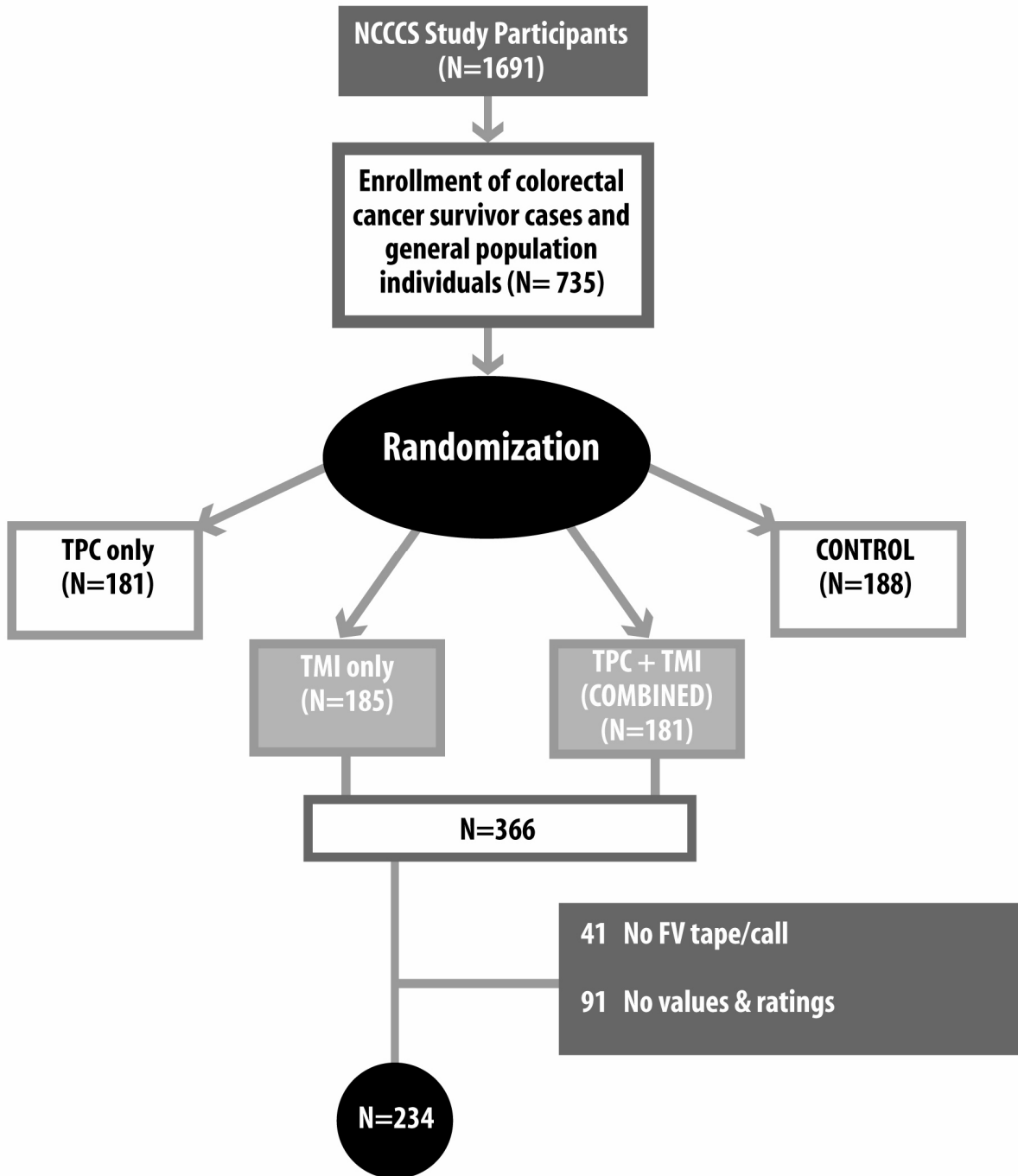
Table 3. Demographic Characteristics of Participants

Characteristic	N	Percentages	Mean
Age (range:42-83)	234		66.58
≤45		3% (7)	
46 to 55		11.5% (27)	
56 to 65		27.4% (64)	
66 to 75		38.5% (90)	
>75		19.7% (46)	
Education	233		
≤8th grade		5.6 % (13)	
Some high school		11.1% (26)	
High school graduate/GED		22.2% (52)	
Trade/Beauty school grad		8.5% (20)	
Some college		23.5% (55)	
College graduate		16.7% (39)	
More than college		11.1% (26)	
Marital Status	231		
Married		65.4% (153)	
Never Married		4.3% (10)	
Divorced		7.7% (18)	
Separated		0.9% (2)	
Widowed		20.1% (47)	
Household Income	234		
≤$10K		9.4% (22)	
$10,000-$19,999		16.2% (38)	
$20,000-$29,999		15.4% (36)	
$30,000-$49,999		25.6% (60)	
$50,000-$74,999		14.5% (34)	
>$75,000		10.7% (25)	
Case status	234		
Colorectal cancer survivor		32.5% (76)	
Non-affected		67.5% (158)	
Race	234		
African-American		36.3% (85)	
White		63.7% (149)	
Sex	234		
Male		50.0% (117)	
Female		50.0% (117)	
Intervention Group	234		
Combined		50.9% (119)	
TMI Only		49.1% (115)	
		Range	
Daily Fruit Vegetable Intake Servings- Baseline	234	1.22-22.89	5.57
Daily Fruit Vegetable Intake Servings- Follow-up	234	1.49-18.77	6.23

Table 4. Chi-Square Summary of Demographic Characteristics of CRC Survivors Compared to CRC Non-affected (N=234)

Characteristics	CRC Survivors N=76	CRC Non-Affected N=158	$\chi^2(1)$	Significance level (p≤0.05)*
Age ≤49 ≥50	6 (7.9%) 70 (92.1%)	7 (4.4%) 151 (95.6%)	0.61	0.36
Education ≤High school High school/GED > High school	11 (14.5%) 23 (23.5%) 41 (53.9%)	28 (17.8%) 49 (31.2%) 79 (50.4%)	3.96	0.86
Martial Status % Married % Widowed	51 (67.1%) 15 (19.7%)	102 (65.8%) 32 (20.6%)	5.76	0.33
Household income ≤$10K $10,000-$19,999 $20,000-$29,999 $30,000-$49,999 $50,000-$74,999 >$75,000	8 (10.5%) 9 (11.8%) 12 (15.8%) 22 (28.9%) 10 (13.2%) 9 (11.8%)	14 (8.9%) 29 (18.4%) 24 (15.2%) 38 (24.1%) 24 (15.2%) 16 (10.1%)	2.32	0.94
Race African American White	31 (40.8%) 45 (59.2%)	54 (34.2%) 104 (65.8%)	0.71	0.38
Sex Male Female	37 (48.7%) 39 (51.3%)	80 (50.6%) 78 (49.4%)	0.02	0.89
Intervention Group TMI Combined	45 (59.2%) 32 (40.8%)	70 (44.3%) 88 (55.7%)	3.99	0.04*
Mean Baseline Fruit and Vegetable Intake Servings	5.8	5.4	0.23	0.58

CRC Survivors N=76; CRC Non-Affected, N=158

The purpose of Aim 1 was to describe and compare the values and fruit and vegetable consumption of CRC survivors and non-affected persons. Raw frequencies and percentages were generated for the values chosen by participants. Family (n=107, 45.7%), health (n=87, 37.2%) and

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God's will (n=80, 34.2%) were the most frequently chosen values. Table 5 provides the frequency distribution of the values.

Table 5. Top 3 Values (N=211)

Value	<u>n</u>	% Choosing this value
Responsibility	42	17.9
Purpose	14	6.0
Helpfulness	24	10.3
Inner Peace	30	12.8
Justice	11	4.7
Hope	9	3.8
Independence	32	13.7
God's will	**80**	**34.2**
Loving	20	8.5
Family	**107**	**45.7**
Spirituality	58	24.8
Forgiveness	4	1.7
Strength	20	8.5
Mental Strength	15	6.4
Humor	15	6.4
Friendship	20	8.5
Growth	9	3.8
Health	**87**	**37.2**
Other	12	5.1

Chi-square analyses were performed to test the association between case status and the values selected to determine if one's case status (i.e. survivor or non-affected) and the values chosen were statistically related. The question analyzed for each of the values was: Are cancer survivors more likely to select _____(value) than non-affected persons? The chi-square test showed that there were only statistically significant relationships for the proportion of cancer survivors versus non-affected persons for values *responsibility* (χ^2_{1df} =3.96, p=<.047) and *friendship* (χ^2_{1df} =4.26, p=<.04). As shown in Table 6, for the value *responsibility*, 3.8% of CRC survivors selected this value compared with 16.1% of non-affected persons. The value *friendship* was selected by 2 CRC survivors (0.9%) compared to 18 non-affected persons (8.5%). It should be noted that there was not a significant relationship between cancer status and selecting *health* as a value.

Table 6. Values by CRC Status (N=211)

Value	Non-Affected Persons (n=141) n (%)	Colorectal Cancer Survivors (n=70) n (%)	$\chi^2(1)$	Significance level (p≤0.05)
Responsibility	**34 (16.1%)**	**8 (3.8%)**	**3.96**	**0.047**
Purpose	10 (4.7%)	4 (1.9%)	0.01	0.93
Helpfulness	20 (9.5%)	4 (1.9%)	2.54	0.11
Inner Peace	20 (9.5%)	10 (4.7%)	0.00	1.00
Justice	10 (4.7%0	1 (0.5%)	1.99	0.16
Hope	5 (2.4%)	4 (1.9%)	0.14	0.71
Independence	18 (8.5%)	14 (6.6%)	1.38	0.24
God's will	51 (24.2%)	29 (13.7%)	0.35	0.55
Loving	13 (6.2%)	7 (3.3%)	0.00	1.00
Family	68 (32.2%)	39 (18.5%)	0.77	0.38
Spirituality	40 (19.0%)	18 (8.5%)	0.06	0.80
Forgiveness	2 (0.9%)	2 (0.9%)	0.03	0.85
Strength	11 (5.2%)	9 (4.3%)	0.87	0.35
Mental Strength	9 (4.3%)	6 (2.8%)	0.09	0.77
Humor	12 (5.7%)	3 (1.4%)	0.71	0.40
Friendship	**18 (8.5%)**	**2 (0.9%)**	**4.26**	**0.04**
Growth	8 (3.8%)	1 (0.5%)	1.16	0.28
Health	56 (26.5%)	31 (14.7%)	0.24	0.63
Other	9 (4.3%)	3 (1.4%)	0.09	0.76

Similarly chi-square analysis were conducted to test the association between racial status and values selected (see Table 7) ; between gender and the values selected (see Table 8); between daily fruit vegetable intake level and values selected (see Table 9); and between intervention group and the values selected. There were no statistically significant relationships between African American and White participants and the values they selected. Additionally, there were no statistically significant relationships between the values selected by those who were received the TMI only intervention versus the Combined intervention. However, there were significant relationships between gender and values selected and between values and fruit vegetable intake. Men (14.2%) were more likely than women (5.7%) to choose *responsibility* as a value (χ^2_{1df} =10.52, p=<.001). And women (10.4%) were more likely than men (3.8%) to choose *inner peace* as their top value (χ^2_{1df} =5.35, p=<.021).

As shown in Table 9, participants (4.3%) who chose *justice* as a value were more likely to eat fruits and vegetables at or above the recommended levels ($\chi^2_{1df} =4.09$, p=<.04) than those eating less than the recommended fruit and vegetable servings (1.0%).

Table 7. Values by Race (N=211)

Value	African American (n=79) n (%)	White (n=132) n (%)	$\chi^2(1)$	Significance level (p≤0.05)
Responsibility	10 (4.7%)	32 (15.2%)	3.47	0.06
Purpose	3 (1.4%)	11 (5.2%)	0.99	0.32
Helpfulness	10 (4.7%)	14 (6.6%)	0.53	0.82
Inner Peace	12 (5.7%)	18 (8.5%)	0.01	0.91
Justice	3 (1.4%)	8 (5.2%)	0.16	0.69
Hope	3 (1.4%)	6 (2.8%)	0.00	1.00
Independence	9 (4.3%)	23 (10.9%)	0.97	0.33
God's will	33 (15.6%)	47 (22.3%)	0.56	0.46
Loving	7 (3.3%)	13 (6.2%)	0.00	1.00
Family	34 (16.1%)	73 (34.6%)	2.50	0.11
Spirituality	25 (11.8%)	33 (15.6%)	0.79	0.38
Forgiveness	0 (0%)	4 (1.9%)	1.08	0.30
Strength	7 (3.3%)	13 (6.2%)	0.00	1.00
Mental Strength	3 (1.4%)	12 (5.7%)	1.37	0.24
Humor	2 (0.9%)	13 (6.2%)	2.98	0.09
Friendship	5 (2.4%)	15 (7.1%)	0.93	0.33
Growth	4 (1.9%)	5 (2.4%)	0.01	0.93
Health	30 (14.2%)	57 (27.0%)	0.36	0.55
Other	5 (2.4%)	7 (3.3%)	0.00	0.99

Table 8. Values by Sex (N=211)

Value	Female (n=110) N (%)	Male (n=101) N (%)	χ²(1)	Significance level (p≤0.05)
Responsibility	**12 (5.7%)**	**30 (14.2%)**	**10.52**	**.001**
Purpose	7 (3.3%)	7 (3.3%)	0.00	1.00
Helpfulness	15 (7.1%)	9 (4.3%)	0.75	0.39
Inner Peace	**22 (10.4%)**	**8 (3.8%)**	**5.35**	**.021**
Justice	3 (1.4%)	8 (3.8%)	1.92	0.17
Hope	4 (1.9%)	5 (2.4%)	0.02	0.89
Independence	17 (8.1%)	15 (7.1%)	0.00	1.00
God's will	48 (22.7%)	32 (15.2%)	2.71	0.10
Loving	8 (3.8%)	12 (5.7%)	0.82	0.36
Family	56 (26.5%)	51 (24.2%)	0.00	1.00
Spirituality	33 (15.6%)	25 (11.8%)	0.49	0.48
Forgiveness	2 (0.9%)	2 (0.9%)	0.00	1.00
Strength	11 (5.2%)	9 (4.3%)	0.00	0.97
Mental Strength	5 (2.4%)	10 (4.7%)	1.55	0.21
Humor	6 (2.8%)	9 (4.3%)	0.50	0.48
Friendship	11 (5.2%)	9 (4.3%)	0.00	0.97
Growth	4 (1.9%)	5 (2.4%)	0.02	0.89
Health	41 (19.4%)	46 (21.8%)	1.17	0.28
Other	4 (1.9%)	8 (3.8%)	1.09	0.24

Table 9. Values by Fruit and Vegetable Intake at baseline (N=210)

Value	≤5 Servings of F/V daily (n=110) n (%)	≥5 Servings of F/V daily (n=100) n (%)	χ²(1)	Significance level (p≤0.05)
Responsibility	20 (9.5%)	21 (10.0%)	0.12	0.73
Purpose	5 (2.4%)	8 (3.8%)	0.56	0.45
Helpfulness	12 (5.7%)	11 (5.2%)	0.00	1.00
Inner Peace	13 (6.2%)	17 (8.1%)	0.76	0.38
Justice	**2 (1.0%)**	**9 (4.3%)**	**4.09**	**0.043**
Hope	5 (2.4%)	4 (1.9%)	0.00	1.00
Independence	16 (7.6%)	16 (7.6%)	0.01	0.92
God's will	39 (18.6%)	41 (19.5%)	0.47	0.49
Loving	8 (3.8%)	12 (5.7%)	0.87	0.35
Family	60 (28.6%)	47 (22.4%)	0.91	0.34
Spirituality	29 (13.8%)	29 (13.8%)	0.07	0.79
Forgiveness	1 (0.5%)	3 (1.4%)	0.36	0.55
Strength	13 (6.2%)	7 (3.3%)	0.91	0.34
Mental Strength	10 (4.8%)	5 (2.4%)	0.78	0.38
Humor	7 (3.3%)	8 (3.8%)	0.04	0.85
Friendship	11 (5.2%)	9 (4.3%)	0.00	0.99
Growth	7 (3.3%)	2 (1.0%)	1.48	0.22
Health	49 (23.3%)	38 (18.1%)	0.68	0.41
Other	4 (1.9%)	8 (3.8%)	1.13	0.29

Table 10. Values by Intervention Group (N=211)

Value	Combined Intervention (n=107) n (%)	Tailored Motivational Interviewing (TMI) Intervention (n=104) n (%)	$\chi^2(1)$	Significance level (p≤0.05)
Responsibility	24 (11.4%)	18 (8.5%)	0.58	0.45
Purpose	8 (3.8%)	6 (2.8%)	0.05	0.83
Helpfulness	13 (6.2%)	11 (5.2%)	0.02	0.89
Inner Peace	18 (8.5%)	12 (5.7%)	0.81	0.37
Justice	8 (3.8%)	3 (1.4%)	1.42	0.23
Hope	5 (2.4%)	4 (1.9%)	0.00	1.00
Independence	18 (8.5%)	14 (6.6%)	0.24	0.63
God's will	43 (20.4%)	37 (17.5%)	0.30	0.59
Loving	14 (6.6%)	6 (2.8%)	2.49	0.11
Family	53 (25.1%)	54 (25.6%)	0.04	0.83
Spirituality	28 (13.3%)	30 (14.2%)	0.08	0.78
Forgiveness	3 (1.4%)	1 (0.5%)	0.23	0.63
Strength	12 (5.7%)	8 (3.8%)	0.41	0.52
Mental Strength	6 (2.8%)	9 (4.3%)	0.35	0.55
Humor	9 (4.3%)	6 (2.8%)	0.23	0.63
Friendship	7 (3.3%)	13 (6.2%)	1.54	0.21
Growth	4 (1.9%)	5 (2.4%)	0.00	0.97
Health	47 (22.3%)	40 (19.0%)	0.44	0.51
Other	4 (1.9%)	8 (3.8%)	0.89	0.35

Baseline fruit and vegetable intake

A series of t-tests compared the baseline mean fruit and vegetable intake level of men and women (Table 11), CRC survivors and non-affected individuals (Table 12), and African Americans and Whites (Table 13).

Table 11. Group Differences for Baseline Daily Fruit and Vegetable Intake by Sex

	Male		Female		df	t
	Mean	SD	Mean	SD		
Fruit & Vegetable Servings	4.89	2.26	6.25	3.25	207	-3.72*

*p< 0.05

There was a statistically significant difference in the number of servings for males (M=4.89, SD=2.26), versus females [M=6.25, SD=3.25; t(207)=-3.72, p=.00]. The magnitude of the differences in the means was moderate (eta squared=.060.)

Table 12. Group Differences for Baseline Daily Fruit Vegetable Intake by CRC Status

	CRC Survivors		Non-Affected		df	t
	Mean	SD	Mean	SD		
Fruit & Vegetable Servings	5.85	3.12	5.44	2.75	232	0.98

There was no significant differences in the daily intake for CRC survivors (M=5.85, SD=3.12) versus non-affected individuals [M=5.44, SD=2.75; t(232)=0.98, p=.33]. The magnitude of the differences in the means was very small (eta squared =0.0004).

Table 13. Group Differences for Baseline Daily Fruit Vegetable Intake by Race

	African-Americans		Whites		df	t
	Mean	SD	Mean	SD		
Fruit & Vegetable Servings	6.04	3.49	5.31	2.42	131	1.89

Finally, there was no significant differences in the daily intake for African-Americans (M=6.04, SD=3.49) compare to Whites [M=5.31, SD=2.42; t(131)=1.89, p=.09]. However, for African-Americans the average daily fruit and vegetable was more than half a serving size (0.73) greater than that of Whites. The magnitude of the differences in the means was very small (eta squared =0.0).

Pearson's correlation analyses for 19 values (*responsibility, purpose, helpfulness, inner peace, justice, hope, independence, God's will, loving, family, spirituality, forgiveness, strength, mental strength, humor, friendship, growth, health*, other [some other value not listed above]) were conducted. Table 14 presents the correlations among the values. There were 19 significant correlations of which 14 met the minimum correlation criterion (r≥0.20 or the .05 level) and five were significant at the .01 level. Of these significant correlations, 11 were positive and 8 were negative. Of note is the strength of the significant correlations reported. These can be described as small as they range from r =.10 to .29). The only exception is that of forgiveness and loving (r=0.31, p<0.01) which indicates a correlation of medium strength. Participants who chose *forgiveness* as value were also likely to choose *loving*. Inspection of Table 14 showed that there were three other correlations of small strength. *God's will* and *health* were negatively correlated (r=-0.26, p<0.01), which indicated that participants who chose *God's will* were less likely to chose *health* as an important value. Finally, the value *strength* was positively correlated with *mental strength* (r=0.29, p<0.01) and with *health (*r=0.22, p<0.01). Persons who chose strength as a value also were likely to choose *mental strength* and *health*.

Table 14. Correlation Matrix (N=234)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. responsibility	1.00																		
2. purpose	0.11	1.00																	
3. helpfulness	**0.16***	**0.14***	1.00																
4. inner peace	0.00	0.00	0.03	1.00															
5. justice	**0.15***	0.11	0.12	-0.03	1.00														
6. hope	-0.05	-0.06	-0.08	-0.02	-0.05	1.00													
7. independence	-0.01	-0.11	-0.11	-0.06	0.02	0.11	1.00												
8. God's will	**-0.19****	-0.09	0.06	**-0.15***	0.12	0.08	**-0.14***	1.00											
9. loving	0.00	-0.09	0.04	-0.04	**0.14***	0.01	-0.05	**0.15***	1.00										
10. family	-0.10	-0.12	-0.13	-0.11	-0.11	-0.03	**-0.17***	0.11	0.09	1.00									
11. spirituality	-0.04	0.09	-0.12	0.08	-0.09	-0.03	0.01	-0.09	-0.05	-0.01	1.00								
12. forgiveness	0.02	-0.04	-0.05	**0.14***	-0.03	**0.14***	0.14	0.11	**0.31****	0.07	-0.01	1.00							
13. strength	-0.04	-0.09	-0.07	0.01	-0.00	-0.07	0.09	-0.09	0.01	-0.04	-0.13	0.07	1.00						
14. mental strength	0.05	0.07	0.02	-0.01	0.02	-0.06	0.04	**-0.14***	-0.03	-0.06	-0.09	-0.04	**0.29****	1.00					
15. humor	0.09	-0.07	-0.04	-0.06	0.02	0.03	-0.01	0.01	-0.03	-0.06	-0.05	0.09	0.04	0.07	1.00				
16. friendship	-0.12	-0.02	-0.07	0.01	-0.08	0.01	-0.00	-0.05	-0.05	-0.01	-0.05	0.07	-0.05	0.04	0.04	1.00			
17. growth	-0.05	0.04	-0.08	0.05	-0.05	-0.05	-0.02	-0.07	-0.07	-0.07	0.03	-0.03	-0.07	-0.06	-0.06	-0.07	1.00		
18. health	-0.10	**-0.15***	**-0.15***	-0.09	-0.11	-0.03	-0.03	**-0.26****	-0.07	-0.00	-0.13	-0.05	**0.22****	**0.14***	-0.12	0.09	0.01	1.00	
19. other	-0.02	0.02	-0.09	0.02	-0.06	-0.05	-0.10	-0.07	-0.08	-0.09	-0.01	-0.03	-0.08	-0.07	-0.07	-0.08	0.05	**-0.16***	1.00

NOTE: **Boldface** indicates significant correlations. * represents significant correlations at the 0.05 level (2-tailed) and ** represents correlations at the 0.01 level (2-tailed).

KEY: 1=responsibility, 2=purpose, 3=helpfulness, 4=inner peace, 5=justice, 6=hope, 7=independence, 8=God's will, 9=loving, 10=family, 11=spirituality, 12=forgiveness, 13=strength, 14=mental strength, 15=humor, 16=friendship, 17=growth, 18=health, 19=other.

Results for Individual Research Questions

Question 1. What were the values selected by CRC survivors as compared with non-affected persons across the different fruit and vegetable consumption categories (above 5 servings and below 5 servings)?

Hypothesis$_{1a}$: Regardless of the level of fruit vegetable consumption, CRC survivors will be more likely to select *health* as a value than non-affected persons.

Among the 234 participants who were either meeting the recommended FV levels or eating below the recommended FV level, case status did not prove to be a significant predictor for choosing the value *health* as important (CRC status coefficient =-.28; SE=.31; χ^2_{1df} =0.80, p=0.37, odds ratio =0.76 ; 95% CI=.42 to 1.39). Age, race, sex, and intervention group were included as control variables in the model and were all insignificant (see Table 15). *These findings do not support the hypothesis that survivorship status would be predictive of selecting health as a value.*

Table 15. Summary of Logistic Regression Analysis Predicting Selection of *Health* as a Value.

Variable	Coefficient (β)	Standard Error	Wald χ^2	P Value	Odds Ratio	95% CI
Intercept	0.06	0.44	--	--	--	--
CRC status	-0.28	0.31	0.80	0.37	.760	0.42 to 1.39
Race	0.09	0.30	0.08	0.78	1.09	0.60 to 1.98
Sex	-0.33	0.29	1.28	0.26	0.72	0.40 to 1.28
Age	-1.01	0.69	2.15	0.14	0.36	0.09 to 1.41
Intervention Group	-0.39	0.30	1.71	0.20	0.68	0.38 to 1.21
FV intake level	0.27	0.30	0.83	0.36	1.30	0.74 to 2.31

Hypothesis$_{1b}$: Regardless of the level of fruit vegetable consumption, CRC survivors will be more likely to select instrumental values rather than terminal values compared to non-affected persons.

To address the above hypothesis, an expert group (N=7) of graduate students, faculty, and professionals with experience using values and motivational interviewing categorized 10 of the 18 values used. Eight of the values used in the list were already categorized previously by Rokeach (1973). Table 16 shows the responses on the categorization provided by the expert group. *Hope, God's will, spirituality, humor,* and *growth* were categorized as instrumental values by the expert group. *Responsibility, helpfulness, independence, loving*, and *forgiveness* were previously assigned as instrumental values by Rokeach (1973). The values *purpose, strength, mental strength, friendship*, and *health* were categorized as terminal values by the expert group. *Inner peace, justice*, and *family* were values already categorized by Rokeach (1973) as terminal values.

Table 16. Values Categorized by Expert Raters

Value Description	Instrumental (number assigning this value type)	Terminal (number assigning this value type)
Responsibility, to do what I said I would do	Instrumental (Rokeach)	
Purpose, to have meaning and direction in my life	3	Terminal (Experts n=4)
Helpfulness, to reach out to others	Instrumental (Rokeach)	
Inner peace, to find a sense of quiet/calmness		Terminal (Rokeach)
Justice, to promote fair and equal treatment for all		Terminal (Rokeach)
Hope, to see what happens in life in a positive way	Instrumental (Experts n=4)	3
Independence, to be able to meet my own needs	Instrumental (Rokeach)	
God's will, to follow God's plan for me	Instrumental (Experts n=5)	2
Loving, to give and receive love	Instrumental (Rokeach)	
Family, to have a happy, loving family		Terminal (Rokeach)
Spirituality, to grow and mature spiritually	Instrumental (Experts n=6)	1
Forgiveness, to be forgiving of others	Instrumental (Rokeach)	
Strength, to be physically fit and capable	3	Terminal (Experts n=4)
Mental strength, to be mentally alert	1	Terminal (Experts n=6)
Humor, to see the funny side of life	Instrumental (Experts n=7)	0
Friendship, to have close, supportive friends	2	Terminal (Experts n=5)
Growth, to keep changing and growing	Instrumental (Experts n=7)	0
Health, to be physically well	2	Terminal (Experts n=5)

Table 17. Frequency of Instrumental Values Selected

Number of Instrumental Values Selected during the Values Clarification exercise	Number of Participants Selecting Instrumental Values (N=211)	Percent
0	36	15.4
1	84	35.9
2	70	29.9
3	18	7.7
4	2	.9
7	1	.4

Table 17 summarizes the frequency of the instrumental values selected by participants. A summary variable was created to describe the number of instrumental values selected by each participant during the values exercise. Thirty six participants (15.4%) did not select an instrumental value, 84 (35.9%) participants selected 1 instrumental value, 70 (29.9%) participants selected 2 instrumental values, 18 (7.7 %) participants selected 3 instrumental values, 2 participants selected 4 instrumental values and one participant selected 7. Note that participants were asked to select their top three values, thus selecting more than 3 values indicated that participants did not follow instructions or were unable to narrow their values choices.

Chi-square analyses were conducted to test the association between case status and the frequency of selecting an instrumental value; racial status and the frequency of selecting an instrumental value; gender and the frequency of selecting an instrumental value; and daily fruit and vegetable intake level and the frequency of selecting an instrumental value. None of these analyses yielded a significant relationship.

Among the 211 participants who completed the values clarification exercise, case status did not prove to be a significant predictor for choosing values deemed as instrumental versus terminal (CRC status coefficient =0.17; SE=.31; χ^2_{1df} =0.30, p=0.58, odds ratio =1.182 ; 95% CI=.65 to 2.15). Age, race, sex, and intervention group were included as control variables in the model and were all

insignificant (Table 18). *These findings do not support the hypothesis that survivorship status would be predictive of selecting instrumental values.*

Table 18. Summary of Logistic Regression Analysis Predicting Value Type Selection.

Variable	Coefficient (β)	Standard Error	Wald χ^2	P Value	Odds Ratio	95% CI
Intercept	-0.14	0.44	--	--	--	--
CRC status	0.17	0.31	0.30	0.58	1.182	0.65 to 2.15
Race	-0.12	0.30	0.16	0.69	0.89	0.49 to 1.60
Sex	-0.07	0.29	0.05	0.82	0.94	0.53 to 1.66
Age	-0.68	0.63	1.15	0.28	0.51	0.15 to 1.75
Intervention Group	-0.55	0.29	3.49	0.06	0.58	0.33 to 1.03
FV intake level	0.05	0.29	0.04	0.85	1.06	0.60 to 1.86

A second aim of this study was to examine the role of values in promoting changes in fruit and vegetable consumption over time. The results presented below for questions 2-5 are related to this aim. Question 2. What were the value categorizations of those who report an increase in fruit and vegetable consumption?

Hypothesis: Those who select instrumental rather than terminal values will be more likely to report an increase in fruit and vegetable consumption at follow-up.

Results from the logistic regression analyses focused on the selection of instrumental values as a predictor of fruit and vegetable increase showed that CRC status was the only significant predictor of fruit and vegetable increase at follow-up,(CRC status coefficient =0.64; SE=.31; χ^2_{1df} =4.14, p=0.04, odds ratio =1.89 ; 95% CI= 1.02 to 3.51). Also included in the model were race, sex, age, and intervention group as control variables which were not significant (Table 19). *These results do not support the hypothesis that selecting instrumental value would be predictive of an increase in fruit and vegetable intake.*

Table 19. Summary of Logistic Regression Analysis Predicting Fruit and Vegetable Increase at Follow-up.

Variable	Coefficient (β)	Standard Error	Wald χ^2	P Value	Odds Ratio	95% CI
Intercept	0.41	0.46	--	--	--	--
CRC status	0.64	0.31	4.14*	0.04	1.89	1.02 to 3.51
Value type	0.16	0.30	0.15	0.70	1.124	0.62 to 2.04
Race	-0.02	0.32	0.00	0.96	0.99	0.53 to 1.83
Sex	-0.31	0.31	1.02	0.31	0.74	0.41 to 1.34
Age	-1.11	0.61	3.28	0.07	0.33	0.09 to 1.10
Intervention Group	-0.06	0.31	0.04	0.85	0.94	0.51 to 1.73

*p <.05

Question 3. Did participants who identified *health* as a value report more change in their levels of fruit and vegetable consumption at follow-up?

Hypothesis: Participants who select *health* as a value will be more likely to have increased fruit and vegetable consumption at follow-up than those who did not select health as a value?

Results from the logistic regression analyses focused on the selection of health as value as a predictor of fruit and vegetable increase showed that CRC status (CRC status coefficient =0.65; SE=.32; χ^2_{1df} =4.29, p=0.03, odds ratio =1.92; 95% CI= 1.04 to 3.56) was the only significant predictor of fruit and vegetable increase at follow-up. Also included in the model were race, sex, age, and intervention group as control variables which were not significant (Table 20). *These results do not support the hypothesis that selecting health as a value would be predictive of increased fruit and vegetable consumption.*

Table 20. Summary of Logistic Regression Analysis Predicting Fruit and Vegetable Increase at Follow-up by the value *Health*.

Variable	Coefficient (β)	Standard Error	Wald χ^2	P Value	Odds Ratio	95% CI
Intercept	0.58	0.46	--	--	--	--
CRC status	0.65	0.32	4.29*	0.03	1.92	1.04 to 3.56
Health as a value	-0.24	0.31	0.62	0.43	0.79	0.43 to 1.44
Race	-0.01	0.32	0.00	0.97	0.99	0.53 to 1.83
Sex	-0.29	0.31	0.89	0.35	0.75	0.41 to 1.36
Age	-1.043	0.61	2.89	0.09	0.35	0.11 to 1.17
Intervention Group	-0.03	0.31	0.01	0.94	0.98	0.54 to 1.78

*<u>p</u> <.05

Question 4. What values were associated with higher levels of importance for eating more fruits and vegetables?

> **Hypothesis**: <u>Those who select instrumental rather than terminal values will be more likely to report higher levels of importance for fruit and vegetable intake.</u>

Results from the logistic regression analyses focused on the selection of instrumental values as a predictor of higher importance of fruit and vegetable intake showed that there were no significant relationships. Also included in the model were race, sex, age, and intervention group as control variables which were not significant (Table 21). *The findings do not support the hypothesis that selecting instrumental values would be predictive of higher levels of importance for fruit and vegetable intake.*

Table 21. Summary of Logistic Regression Analysis Predicting Fruit and Vegetable Importance.

Variable	Coefficient (β)	Standard Error	Wald χ^2	P Value	Odds Ratio	95% CI
Intercept	4.03	1.35	--	--	--	--
CRC status	-2.01	1.09	3.39	0.06	0.13	0.15 to 1.14
Value type	-0.48	0.63	0.57	0.45	0.62	0.18 to 2.14
Race	-0.22	0.67	0.11	0.75	0.80	0.21 to 3.03
Sex	0.67	0.64	1.10	0.29	1.95	0.56 to 6.78
Age	-2.01	1.23	2.66	0.10	0.13	0.01 to 1.50
Intervention Group	-0.37	0.66	0.32	0.57	0.69	0.19 to 2.50

5. What values were associated with higher levels of self-efficacy to consume more fruits and vegetables?

> **Hypothesis:** Those who select instrumental rather than terminal values will be more likely to report higher levels of self-efficacy for fruit and vegetable intake.

Results from the multiple regression analyses focused on the selection of instrumental values as a predictor of higher self-efficacy for fruit and vegetable intake showed that there were no significant relationships. Also included in the model were race, sex, age, and intervention group as control variables which were not significant (Table 22). *This finding does not support the hypothesis that selecting instrumental values would be predictive of higher levels of self-efficacy for fruit and vegetable intake.*

Table 22. Multiple Regression Analysis for Predicting Self-Efficacy for Fruit/Vegetable Intake.

Variable	Coefficient (β)	SD
CRC status	0.17	0.46
Value type	-0.00	0.50
Race	0.13	0.48
Sex	-0.03	0.50
Age	0.03	0.24
Intervention Group	-0.05	0.50
Intercept = 8.31		
R^2=0.058		
N=85		

DISCUSSION

The purpose of these analyses was to identify relationships among personally-held values and fruit and vegetable intake. Specifically, the aims of this study were to: (1) describe and compare the values and fruit and vegetable consumption of CRC survivors and non-affected persons and (2) examine the role of values in promoting changes in fruit and vegetable consumption over time. The values findings as measured in this study indicate that CRC survivors were more likely to select the values *responsibility* and *friendship*. CRC status was not a significant factor for selecting the value *health* regardless of baseline fruit and vegetable intake level. There was also no statistically significant difference by type of value (instrumental or terminal) selected by CRC survivors and non-affected individuals. For baseline daily intake of fruits and vegetables there were no significant differences by cancer status. When examining relationships over time for fruit and vegetable intake and values, none of the proposed hypotheses were supported. However, CRC survivorship status was the only predictor of an increase in fruit and vegetable consumption at follow-up.

By using existing data to determine the role of values in fruit and vegetable intake this study has limitations in the breadth of information gathered from participants about their personally-held core values. Several factors may have contributed to these null findings. First, during the values clarification exercise participants were not asked to rank their top three selected values. Ranking indicates the hierarchal nature of a person's value system. Although the value *health* was most frequently selected, it was not possible to ascertain whether this value was preeminent for participants. Another limitation may be that the values did not represent a comprehensive values list. This study used a modified list of 18 values. Although participants were given the option to choose values not on the list, few did so. A third limitation was the data on fruit and vegetable was self-reported and as such open to response bias. The notion that CRC survivors undergo a "teachable moment" due to a cancer diagnosis and are more open to health behavior changes has been supported in the literature (Blanchard et al., 2003;

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Demark-Wahnefried et al., 2000). Another limitation is that the sample included a somewhat of a

selected group of CRC survivors who were still healthy two years post-diagnosis. As such, they may

have already made improvements in their diets. Finally, value type, that is, whether instrumental or

terminal, was not predictive of health behavior. It was plausible to suggest that instrumental values

(symbolizing idealized ways that are needed to achieve the ideal self) would be readily endorsed by

those survivors and would be motivators to behavior change. However, the type of value was not

predictive of behavior change. Further research is needed to discern whether a particular value or a

cluster of values is predictive of health behavior changes.

<u>**CHAPTER SIX: PAPER TWO**</u>

Values Clarification: Understanding the Role of Values in Fruit and Vegetable Intake

Introduction

Many researchers and theorists have drawn attention to the importance of an individual's value priorities in understanding and predicting behavioral decisions. Generally, people are unaware of their value hierarchies. Engaging in a values self-confrontation exercise, such as Rokeach's (1973) values self-confrontation method, may be a way to set and modify priorities and resolve conflicts. Individuals become aware of their value hierarchies when they rank them according to their importance as guiding principles in their lives. In essence, values self-confrontation can either serve to initiate changes or strengthen the stability of beliefs, attitudes, values, and behaviors.

Belief system theory contends that the main mechanism mediating change after values self-confrontation is experiencing a state of dissatisfaction. This hypothesis has been supported by several studies (Grube, 1978; McLellan, 1974; Rokeach, 1973; Sanders and Atwood, 1979, and Sherrid and Beech, 1976). However, Sawa and Sawa (2001) argue that there may be other mechanisms that determine the degree of the induced dissatisfaction. Sawa and Sawa (2001) propose that the dissatisfaction following a values assessment exercise that may induce health behavior change is dependent on three conditions: *health* salience, dissatisfaction with current behavior, and degree of inconsistency between current behavior and beliefs about ideal levels of behavior. Studies have focused on the outcomes of the values self-confrontation exercise. Surprisingly, none have reported on details of the process.

One way of operationalizing the values self-confrontational method is within motivational interviewing. Motivational interviewing embodies a client-centered approach where the focus of the counselor is on listening and reflecting to help the clients find solutions that fit their goals and lifestyle (Rollnick and Miller, 1998) Values within the context of motivational interviewing can serve to: 1) help individuals define their ideal self; 2) stimulate motivation for change by focusing on discrepancies between the actual versus ideal self; 3) reduce ambivalence about behavior change, and 4) increase confidence in the ability to change. Studies using brief motivational interviewing interventions to promote changes in diet and diet-related behaviors have been promising (Smith et al., 1997; Berg-Smith et al., 1999; Resnicow et al., 2000). Focusing on individuals' core values is considered a useful tool as values may stimulate motivation for change and serve to increase participant engagement (Sanchez, 2000). However, to date there are few published reports of values used in conjunction with motivational interviewing to promote behavior change.

Thus, the present study examined values self-confrontation as part of motivational interviewing counseling to understand the why and how of change related to fruit and vegetable intake. Specifically, the meanings ascribed to values, the salience of *health* as a value, and beliefs about dietary intake were investigated. The study sample of older adults included CRC survivors and a similar comparison group. Health behaviors such as fruit and vegetable intake, important for improved survival, prevention of recurrence, and reduction of risk for other chronic diseases are pertinent to this survivor group (Pinto, et al., 2000). Because CRC cancer survivors are thought to be at increased risk for cancer recurrence (Brown et al, 1993; Hewitt et al., 1999) they could benefit from research aimed at changing health behaviors. With longer survival they are also at risk for other co-morbidities such as diabetes.

Research Questions/Hypotheses

In this qualitative study I examined several dimensions of the values self-confrontation exercise theorized to promote behavior change. The overarching goal of this study was to factors related to personally-held values and their influence on fruit and vegetable intake.

Aim: To examine how values function for colorectal cancer survivors and non-affected persons at different levels of fruit and vegetable consumption.

The following questions guided the study:

*Research Question 1***:** How did participants categorize their values?

Research Question 2: How was the value *health* discussed?

Research Question 3: How did participants discuss their beliefs about their ideal fruit and vegetable consumption?

Methods

Study Design

A case comparison study was undertaken to understand the role of values in fruit and vegetable intake for CRC survivors compared with non-affected persons. Specifically, identifying differences in how values were discussed in the context of health promotion and to understand whether the hypotheses presented in the conceptual model regarding the value-self confrontation exercise played a role in promoting fruit and vegetable consumption.

Study Sample

Participants in the randomized control NC STRIDES study who were randomized to receive the TMI intervention (4 counseling calls) were the target for this study. For the present analyses, the sample was restricted to participants who had: 1) completed baseline and follow-up surveys; and 2) provided information about their personally-held values in relation to fruit and vegetable intake.

Of the 366 participants randomized to the TMI and Combined groups of the NC STRIDES study, only 82 were eligible for this study (see Figure 5). Those ineligible were 41 participants who did not complete a fruit and vegetable TMI call, 91 participants who completed a fruit and vegetable call but did not complete the values rating nor the importance and confidence ratings as part of the call, 149 who had partial information for the values, fruit and vegetables importance, and confidence ratings, and the three participants for whom their audio tapes were inaudible.

A stratified purposeful sampling approach was used to select cases from the pool of 82 participants. Cases were chosen that represented the various degrees and types of variation relevant to understanding the phenomena under study (Sandelowski, 2000). The aim was to examine how CRC survivors and non-affected persons at varying levels of fruit and vegetable consumption perceived the role of values in relation to their current dietary behavior. Thus the pre-selected parameters used to select cases for this study were: intervention group (TMI or Combinded), cancer status (CRC survivor or non-affected), daily fruit and vegetable intake level (less than 5 serving or above 5 servings), sex, and race (Black or White).

Figure 6 illustrates the stratified purposeful sampling plan used for the research. Given the pre-selected parameters there were 32 levels of variations and potentially there could be n^{th} cases in each level but the intent was to include 1 case for every variation for a total of 32 cases to be examined. Some cells did not contain a case. For example, in the Combined intervention there were no Black males who ate 5 or more fruit and vegetable servings, and were cancer survivors. There were 11 White males who ate less than 5 servings of fruits and vegetables, and were CRC non-affected. Similarly, in the TMI Only intervention, there were no White females who ate more than 5 servings of fruits and vegetables that were CRC survivors. But there were three White males who ate more than 5 servings of fruits and vegetables that were CRC survivors. Figure 7 illustrates the actual resulting sample based on the plan described above. The Combined Intervention yielded a total of 43 cases and the TMI Only

Intervention yielded 39 cases (a total of 82 that were eligible). For each variation that had multiple

cases, I selected at random one case for the analysis. With one case selected for each available

variation a total of 24 cases were included.

Figure 5: Sample for Present Study

Figure 6. Purposeful-Stratified Sampling Plan

Combined Intervention																TMI Intervention Only															
CRC Survivor								CRC Non-Affected								CRC Survivor								CRC Non-Affected							
≥5 FV				≤5 FV				≥5 FV				≤5 FV				≥5 FV				≤5 FV				≥5 FV				≤5 FV			
M		F		M		F		M		F		M		F		M		F		M		F		M		F		M		F	
B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W	B	W

=32 levels of variation

Key: B= Black, W=White, M=Male, F=Female, FV= Fruit & Vegetable servings, TMI=Tailored Motivational Interviewing intervention, Combined=TMI + Tailored Print intervention

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Figure 7. Sample Selected Using Purposeful-Stratified Sampling Strategy
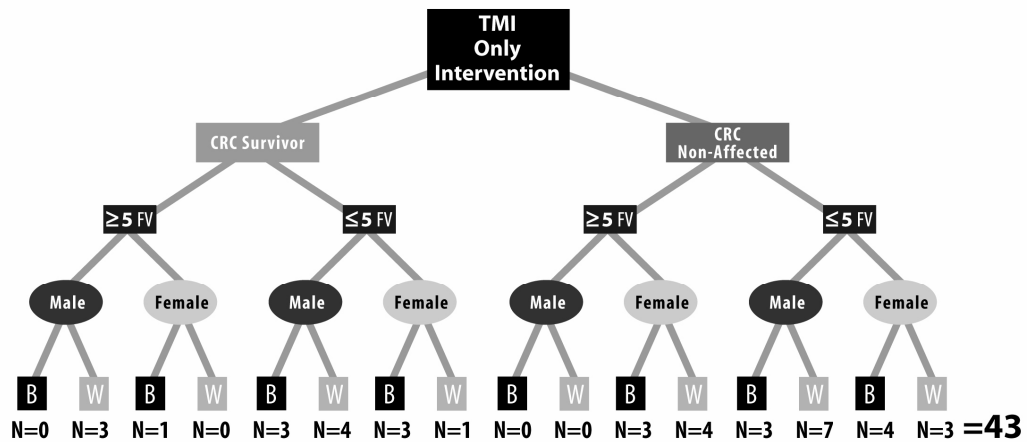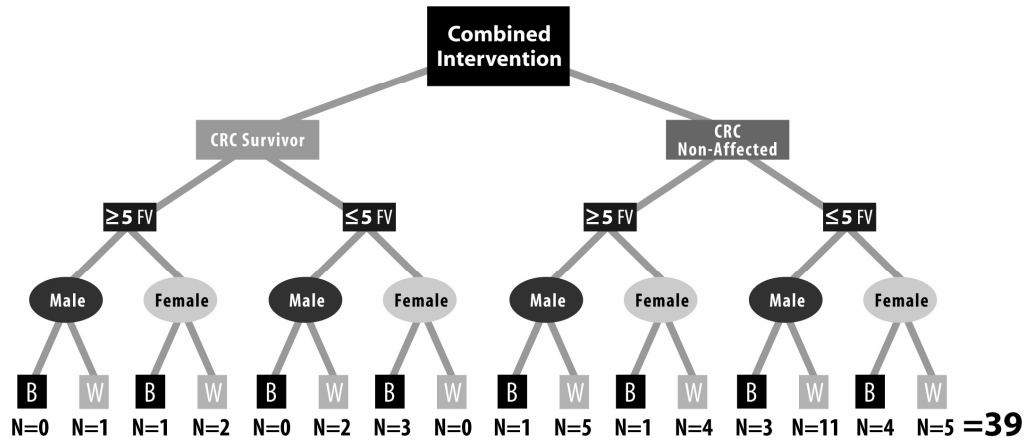
Data Collection

Data for the present study were obtained from the motivational interviewing telephone calls focused on fruit and vegetable intake. The calls followed the roadmap described earlier (see Figure 2) and included the values clarification exercise as show previously in Table 1. Each call lasted approximately 20-30 minutes and generated on average eight pages of text. All motivational

interviewing calls selected for analysis were transcribed verbatim by experienced transcribers. I then listened to each call and proofed all transcripts for accuracy.

Data Analysis

Cross-case comparison was the primary analytical strategy used as Miles and Huberman (1994) described. First, a frequency analysis was performed using SPSS version 13 to determine the demographic characteristics and values selected by the sample. Second, I created a visual display to organize each participant based on one of the key variables (sex, race, age, case status, fruit and vegetable tape number, interviewer performing the call, values, intervention group, fruit and vegetable intake level, FV importance rating, FV confidence rating, values discussed, and FV connection). Third, based on the results of comparisons from this first level of analysis, other data-derived tables were created to compare cases.

Given that the goal was to examine the theorized relationships shown in the conceptual model, one a priori analytical line of inquiry was to compare how CRC survivors and non-affected persons categorized their values. The cancer experience is often referred to as a "teachable" moment that may redirect survivors to live in more meaningful ways (Belec, 1992; Dirksen, 1995). Therefore, survivors may live with a greater sense of purpose and their values may reflect behaviors symbolic of individuals' ideal selves more so than for non-affected persons. Understanding how participants described their values and whether they perceived values as influencing their fruit and vegetable intake could furnish an explanation of whether values are behavior-promoting. Table 23 shows an excerpt from a cross-case display used to discern patterns in the discussion of values, value types and relationship to other values.

Because the behavior being investigated (fruit and vegetable intake) had health implications, it was also important to understand how participants considered the value *health* in relation to their diet.

Other relevant relationships investigated were the processes that result from either a value-behavior consistency or discrepancy. The ability to tease out the absence or presence of a particular variable was needed to investigate whether Sawa and Sawa's (2001) proposed variables indeed mediate the relationship between value-behavior discrepancy and self-dissatisfaction. Alternatively, I also considered what else might be occurring during the values self-confrontation process that may be relevant for CRC survivors and non-affected persons.

Although the relationships described above were apparent lines of inquiry, in the process of conducting these analyses additional features relevant to understanding how values function dictated other directions for examination. As an example of a data derived analytical move, I compared whether particular discourses were part of the values discussion. When talking about health, some participants talked about the body-temple connection, an idea steeped in religion that the body is God's temple. Therefore, I examined whether other possible discourses (e.g., religious and cultural) were interwoven in these discussions. Another level of data driven comparison involved examining participants' attitudes, beliefs, and knowledge given that the process of motivational interviewing allows participants to explore these issues in relation to behavior change. A key feature of MI is helping individuals work through their ambivalence about behavior change, solve their own barriers, and explore potential untapped sources of motivation (Miller and Rollnick, 1991; 2002). Therefore, I categorized participants in the following ways: (1) Knowledge & practice: referred to participants discussion about what they knew about fruits and vegetables and their adherence to or departure from relevant action; (2) Beliefs & practice: referred to participants' internal and seemingly deep rooted beliefs about how fruits and vegetables function and how those beliefs then determined dietary action; and (3) Motivation & knowledge: referred to what participants knew and how this knowledge shaped their motivations. These were the kinds of inquiries that were pursued during the analysis process.

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Word files were maintained to manage the verbal and visual displays of the data. In order to optimize descriptive, interpretive and theoretical validity (Maxwell, 1992), an audit trail (Rodgers and Cowles, 1993) was kept to document and explain any procedural and analytic decisions made in the analysis process. See Appendix A for a summary description of the 24 cases.

Table 23. Excerpt of Cross-case Display of Value Type

Case #	CRC Status	Values Selected	How values related	How described	Instrumental (way of conduct) or Terminal (an end state)	Connection to FV
9	Non-affected	God's will Inner Strength Humor	1 primary value: God's will	**God's will:** I just believe that everything you do should be part of God's will (instrumental) **Inner strength:** you can't display for me any physical strength or anything unless you have some inner strength...It has to come from within first...(instrumental) **Humor:** you could...have a calming effect on anything any angle anything anybody displayed towards you by using humor. And I still do it.	God's will =instrumental (experts) Discussed as instrumental Humor =instrumental (experts) Discussed as instrumental	- Don't want to sound preachy. But Bible says you're supposed to present your body as a living temple and a living sacrifice, so if you're going to take care of it, you got to eat healthy, and eat right, and you know exercise and do the things that right. And you have to have inner peace...b/c you know you [can't be] depressed angry all the time...has an affect on your physical being... -And humor can calm any situation
13	Survivor	God's will Family Spirituality	1 primary value that governs the others. If value God's will then others will align accordingly	**God's will**: I feel that if you follow in God's will a lot of these others [values] would fall in line with it. **Family**: most important thing I think as far as our earthly walk...Ah, cause God has designed the family to be his basic... well, I know I'm kind of getting this mixed up…But, the family's the beginning of everything. And if you let God lead you, then you will have a strong family ties and influence. **spirituality** is your relationship with God and just let him lead your life.	God's will = instrumental (experts) Discussed as instrumental Spirituality =instrumental (experts) Discussed as instrumental, an active relationship	"Well, if I eat more fruits and vegetables, then I will be probably influencing my responsibility to lead a healthy life and therefore help my family and perhaps lead a more helpful [life] and just be more beneficial to people in general, if I take care of myself."

Table 23. Continued

15	Survivor	God's will Health Strength	God's will ~strength (connected to each other) Connection not described	**God's will:** trusting him and having faith in him **Health**: try to stay healthy as long as you can **Strength**: the Lord gives strength by having faith in him and trusting in him	God's will = instrumental (experts) Daily, active relationship=instrumental	Thinks connection to health and doing God's will but did not describe
16	Non-affected	Health Strength Independence	Health = long life Health = independence + strength	**Health:** Plan is to live until 92. Now 60yrs so need to be healthy to get to live that long **Strength:** talked about with independence **Independence:** No value to living long if don't have independence and strength. Has a lot of hobbies and haven't delved into all yet- deeply enough.	Health =terminal (experts) Discussed as terminal Independence=instrumental (Rokeach)	FV is a key ingredient to being healthy. Eating less meat, more FV, and exercise part of being healthy. Having good health is important to being independent and having strength.
Case #…						

Findings

There were three major findings from this study. The first finding related to the predominance of *health* as a value*.* The value *health* was one of the most frequently endorsed as important. Sawa and Sawa (2001) suggested that to understand how values operate, it is crucial to get a sense of the salience of the value *health* to the individual. Participants' descriptions of *health* were framed as holistic and moving beyond merely diet. When *health,* as a value, was discussed there were three variations of how this value functioned: (1) *health* functioned as a necessary component for other values. That is, being in good health was a gateway for attaining/fulfilling other values; (2) *health* functioned as a manifestation of *God's will* and; (3) the value *responsibility* was a co-requisite for *health.* These three variations of the value *health* are shown in Figure 8.

A second finding was that participants perceived the values they endorsed to act in both health promoting and limiting ways. They discussed, in particular, the values *God's will* and *independence* as having dual functions. The third finding related to the two distinct patterns of adherence to fruit and vegetable intake- -those who were eating at the recommended vs. those not eating at the recommended levels. In addition to individual values, participants' knowledge, attitudes and beliefs about fruits and vegetable played a major role in determining the levels at which they ate. Differences in attitudes and beliefs were seen based on whether participants were eating above or below the recommended levels.

First I present the characteristics of the study sample. Next, I discuss the predominance of *health* as a value showing the holistic nature in which it was considered. I then present the three variations of how *health* functioned. The second finding where a particular value can be both health promoting and health inhibiting is described. Then, I discuss how participants' attitudes and beliefs play a role in their levels of fruit and vegetable adherence. Finally, I discuss these results.

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Sample Values and Fruit and Vegetable Characteristics

The purposeful-stratified sampling yielded 24 cases. The mean age of participants selected was 66 years (SD=10.28), with their ages ranging from 44 to 82 years. Included were 10 African Americans and 14 Whites. Thirteen were female and 11 were males. Sixteen were married, six widowed, 1 divorced, and 1 participant who had never been married. About equal numbers of CRC survivors and non-affected persons were married or living with a partner (7 versus 9). Almost all except 1 CRC survivor and 2 non-affected persons had a high school education or more. More than half (n=15) earned at least $30,000 annually with CRC non-affected accounting for the majority in this group (n=10). Half of the sample was in the combined intervention and the other half received the TMI intervention. Fourteen participants were CRC survivors and the other 10 participants never had CRC. Half the sample were adherent to the fruit and vegetable guidelines, that is, eating five of more servings daily. The other half fell below the recommended levels. Table 24 shows the sample characteristics.

The top values chosen by participants were *family, God's will, health and spirituality* respectively. Table 25 shows values chosen by the sample. No one chose *purpose* as a value. Almost equal numbers of survivors and non-affected persons selected the most frequently endorsed values. CRC survivors did not select *purpose, helpfulness, justice, mental strength and humor.* Non-affected persons did not select *purpose, hope,* or *forgiveness.* Of note was that more people who were not eating at the recommended levels (n=5) selected *health* as a value, whereas only 3 eating at or above the recommended included *health* as a top value.

Table 24. Characteristics of Study Participants (N=24)

Characteristics	Colorectal Cancer Survivors	Non-Affected Persons
Total	10	14
Age in Years (range 44-82)		
40-50	1	0
50-59	3	4
60-69	3	4
70-79	2	5
80-89	1	1
Sex		
Male	5	6
Female	5	8
Education		
<High school education	1	2
≥High school education	9	11
Income		
<$30,000/yr	5	4
≥$30,000/yr	5	10
Marital Status		
Married/living with a partner	7	9
Widowed	2	4
Divorced	0	1
Never Married	1	0
Race/ethnicity		
Black	4	6
White	6	8
Baseline Fruit/vegetable Servings		
< 5 servings/day	6	6
≥5 servings/day	4	8

Table 25: Value Frequency by Participant Characteristics

Value	Number of CRC survivors choosing this value N=10	Number of CRC non-affected choosing this value N=14	Number Eating ≥5 servings choosing this value N=12	Number Eating ≤5 servings choosing this value N=12	Total Number of participants choosing this value N=24
Responsibility	3	1	2	2	4
Purpose	0	0	0	0	0
Helpfulness	0	2	1	1	2
Inner Peace	2	4	4	2	6
Justice	0	1	1	0	1
Hope	1	0	1	0	1
Independence	4	2	4	2	6
God's will	**4**	**5**	**5**	**4**	**9**
Loving	3	1	3	1	4
Family	**5**	**6**	**5**	**6**	**11**
Spirituality	**4**	**4**	**5**	**3**	**8**
Forgiveness	1	0	1	0	1
Strength	3	1	1	3	4
Mental Strength	0	2	1	1	2
Humor	0	1	1	0	1
Friendship	1	3	1	3	4
Growth	1	1	1	1	2
Health	**3**	**5**	**3**	**5**	**8**
Other	1	1	0	2	2

Predominance of *Health* as a Value

The Meaning of *Health*. As participants described the meaning of the value *health*, they indicated that they recognized the benefits of fruits and vegetables in the diet. Not only was the idea that "*fruits and vegetables are a key ingredient to being healthy*" clearly stated, but also that without health a person really cannot enjoy the benefits that life has to offer. A white male participant not eating at the recommended level indicated that:

I think, a lot of people stress money and wealth. I think the really important thing is health because no matter how much money you've got, you know, if you don't have health, you can't enjoy anything.

Although he was not meeting the fruit and vegetable recommendations, he believed that one's health was of utmost importance, if one is to enjoy life. To be in good health, as he indicated, meant that other goals and pleasures would have richer meanings. His suggestion was that health was the paramount goal. The message was that individuals may aspire to live long, healthy, productive, enjoyable lives but could do so only if their health is intact. As a white male CRC-non affected male, eating at the recommended levels stated:

[My] plan is to live until 92. I'm now 60 years so I need to be healthy to get to live that long.

Fruits and vegetables is a key ingredient to being healthy.

Another male participant not meeting the diet recommendations confirmed this idea that *health* as a value in one's life has to take precedence or in the long run the other things lose their importance because poor health is limiting in a number of ways. He warned, "*If you don't see health as important and put other things in place, you will pay the price at some point.*"

When CRC survivors and non-affected individuals referred to *health* they meant more that just diet. Rather, *"health is also being physically active more than just diet."* A white, CRC non-affected male suggested that part of the health formula included exercise:

Eating properly is the key…at least two-thirds of the key to being healthy is eating properly.

I'm not doing it yet. Eating fruits and vegetables and eating less meat and balancing out with the right kind of carbohydrates is how you do it. For me also with a little bit of exercise.

From the participants' perspective, health was not only salient due to being older, having had CRC or some other major disease but viewed as including more than nutrition and also having a physical and mental component. The benefits of being in good health served to enhance one's mental and spiritual wellness. An African-American woman who was eating more than the recommended amounts pointed out:

I think a person who eats fruits and vegetables, [is] taking care of his body mentally and

spiritually. And I think that when you take care of your body, you're mentally alert and

physically alert.

A white, CRC non-affected woman said, "*If I know I'm eating well, I feel better physically, mentally and I*

know I'm doing right." Underlying this sentiment is the idea that achieving physical and mental health is

pursuing what is best for her development.

Another meaning ascribed when discussing the value *health* was the idea of one's health being

vulnerable to diseases and the aging process. Being susceptible to illness warranted attempting to

protect one self. This susceptibility was also thought of as being due to one's genetics and therefore

having the ability to pass down illness from one generation to another. In the latter case, building up the

immunity of the recipients of the disease gene, in this case cancer was of utmost importance.

For CRC survivors, surviving colorectal cancer meant having time to re-prioritize what was

really important and to prevent succumbing to cancer again. One male survivor pointed out that he,

"*Never thought about how easy it is to pick up an apple instead of a bag of potato chips."* It was only

after battle with cancer and his grandchild being born in the same time period that he:

Realized that the normal real world stuff was less important, rather keeping up with family and

grandkids was more important.

The benefit of valuing health as result of the cancer was clear in that a renewed focus on

health allowed for the fulfillment of other values. Eating fruits and vegetables after surviving cancer

was now a way to take control in building one's defense against cancer recurrence and other diseases.

For example, another cancer survivor responded that having survived cancer he does not now want to

die of a heart attack because of pursuing unhealthy eating habits. He explained:

Well, it's important to eat a decent menu of foods. You know if you are going to be healthy and

physically fit and have the energy, you have to eat the right set of foods. You just can't eat junk

all the time. You can't eat hamburgers and stuff like that because there's too much saturated

fat. I survived cancer and I don't want to die from a heart attack.

This sense of pursuing healthy behaviors like eating fruits and vegetables to build one's immunity was

not limited to the individual. Rather, another survivor explained that, because of her belief that cancer

was hereditary, she felt that including fruits and vegetables in the diet as a weapon to ward off cancer

in her grandkids was appropriate. She explained:

I hate to think that I passed this thing [cancer] on down to one of them. But if they do, they are

all already eating the stuff they are suppose to be eating they stand a better chance of fighting

it off.

In sum, meanings participants ascribed to the value *health* reflected concepts previously

described in the literature. Smith's (1980; 1981) review of the health literature concluded that there are

four general conceptions for defining health. There are: (1) clinical, in which health is thought of as the

absence of disease or symptoms; (2) role performance, health is seen as the ability to fulfill socially

defined roles; (3) adaptive, in which health is viewed as a flexible adjustment to changing

circumstances; and (4) eudaimonistic, in which health is viewed as exuberant well-being that reflects

the full development of the individual's potential. In this study, participants described each of these

variations of health. However, the predominant conception mirrored the eudaimonistic model where

participants discussed health as including components of physical, mental and spiritual wellness, and

constituted more than what one consumed. Health had to do with components that were necessary for

the full development of the individual's potential. The eudaimonistic model focuses on the entirety of

the person, including the physical, social, aesthetic, and moral, not just behavioral and physiological

aspects. In essence, health is wholeness and fulfillment of one's potential.

Health as a necessary component for other values

The holistic view of health being broader than just one behavior, e.g. fruits and vegetables in the diet, and a necessary component of physical, mental, and spiritual wellness was also seen in the way participants discussed how _health_ was connected to other values. Valuing _health_ meant that other values were fulfilled as a result, that is, if you were in good health then it was possible to realize other values deemed important. In this variation of how the value _health_ functioned, health was a necessary prerequisite for doing all other things deemed important. Good health was linked to several values. They were (1) _independence_, being healthy to have the ability to meet one's needs (2) _strength,_ being healthy so one would have strength to maintain the demands of daily function, (3) _God's will,_ being healthy so one could serve God to the fullest and do what He required; (4) _family_, being healthy so one could spend quality time with family; (4) _helpfulness_, being healthy so one could help and serve others and; (5) to be healthy so one could meet one's goals.

The value _health_ and its connection to _independence_ is an exemplar of the linkage between values. The description below shows how _health_ functioned as a necessary component for the value _independence_ described as the ability to meet one's need. To be independent was discussed as a co-requisite of having good health. In the face of poor health, one's independence was threatened, compromised, and hindered.

The mere thought of being in poor health incited anxiety about losing one's independence. A male participant, not meeting the fruit and vegetable recommendation, but who considered himself to be in good health, when talking about the importance of health said:

And there is so many people dependent on others because they're unhealthy. You're

dependent on somebody else to do some minor task you should be able to perform yourself.

And health is so important. I couldn't imagine what would happen if for some reason that I was

confined to the bed. I think that would be the end of me. Cause I've been in the hospital once

in my life. And to be stuck in a bed for any amount of time, drives me nuts.

To have one's health intact meant to be free of making impositions on others and to be able to do the

day-to-day things that you should be doing for yourself like driving or gardening. *Health* as it was linked

to *independence* was viewed as functional-the ability to carry out a given task. A white male survivor,

even though he was not eating at the recommended level, pointed out the health and independence

link. He said:

I'm a firm believer, as you get older, if you don't maintain your strength, then you become

something less than what you were. You can't do things that you want to do. So if you work at

becoming physically fit, then you have to maintain your strength, and you can continue to do

things into a nice, ripe age.

Yet another participant echoed this sentiment that *health* was linked to *independence* in terms of lack

of every day functioning. An African American female CRC survivor related how the loss of her health

also translated to the loss of her independence:

I wished I could walk like other people, but I feel I feel like if I exercise more that, you know, it

would strengthen my muscles. I see a lot of people get out here early in the morning and they

walk, you know. They have a certain time that they walk and a certain distance, I guess. But I

can't walk like that. I walk in my yard.

She further elaborated about how her health limited her from doing the things she normally enjoyed.

She stated:

No, I don't have a garden. I can't. I can't do that. I'm not strong enough. I used to, but I, I can't.

My health won't let me now.

The loss of health or diminished health also translated into dependency that was perceived as

a burden to others. One male CRC non-affected participant not meeting the fruit and vegetable

recommendation said, "*When living alone, one needs to be able to take care of oneself so as not to be a burden to anyone else*". A female CRC survivor related her frustrations about being perceived as incapable during illness:

> Friday, I got mad with my friends, because I was sick, I knew I was sick, but I wanted to go on. And by them feeling sorry for me and stuff like that, they made me feel like I'm not capable of doing for myself. So I need my independence.

Earlier in the conversation she expressed not wanting to be an emotional burden due to her illness. She said, *"I don't want to feel sorry for myself. And I don't want nobody else to feel sorry for me, either."*

In the above example of the values *health* and *independence,* participants talked about *health* as allowing one to maintain one's independence. If health was compromised so was their ability to be independent. As such one value, *health* functioned as a necessary component for attaining another value, in this case, *independence.*

Health as a manifestation of *God's will*

The second variation of how *health* as a value functioned was as a manifestation of *God's will*. Of note, even though *God's will* was selected as important for guiding one's life, almost all of the participants discussing *God's will* as a top value were not following the dietary guidelines. A white female participant who was not eating the recommended amounts of fruits and vegetables stressed that, "…*when you're taking care of your body you're pleasing God."* Specifically, *God's will* was described as the dominant value that dictated all decisions, preferences and values. When talking about eating more fruits and vegetables, an African American participant not meeting the diet recommendations explained:

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I just believe that everything you do should be part of God's will. You know, any decisions or

whatever you do should be part of God's will.

A white male not meeting the recommendations also agreed that God's will was the main factor that

guided his life but also suggested that it should be so for others. He stated:

Well, I think the main thing in my life is really the prayer and the worship of God in the church

and the religious part of it. That should be in everybody's life.

An African American male survivor not meeting the recommendations also endorsed the belief that

God's will should be the foremost value as this then becomes the guiding principle for all other things.

When choosing his top three values, he stated:

The first one [value] would be *God's will* and I feel that if you follow in God's will a lot of these

others [values] would fall in line with it.

Another example of *health* as a manifestation of *God's will* was in evaluating the likelihood for success

for improving one's diet. Even if a person was to strive for good health or other things in life, those

efforts were deemed futile if they were not in accordance to or were guided by *God's will*. An African

American male participant not meeting the recommended diet explained:

 And I don't think that by doing all the physical things that you can on your own will be that

beneficial. You put God first and that's where you put your confidence.

God's will as a guiding principle dictated how participants should regard their health. Following

guidelines and beliefs that were understood to be in accordance to God's will and pleasing to God were

connected to one's view of one's health. Participants conveyed a sense of obligation when talking

about eating well as a part of being healthy and understanding that their bodies were considered a

temple of God. The body-temple connection is a reference to the Biblical meaning of one having to be

a good steward of even one's body: "What? know ye not that your body is the temple of the Holy Ghost

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which is in you, which ye have of God, and ye are not your own?" (1 Corithian 6:19). A female

participant affirmed that, "*Our bodies are the temple of the Holy Spirit and I am sure God is pleased*

when we take care of it." Because one's body was considered in this way then it followed that the body

ought to be treated in a certain way. Another participant admitted that:

> I think when you stop and think about your body being a temple and you want to keep it holy
>
> that in it self is a reminder, you know, of some of the things you need to do on a daily basis.

Not only was God pleased when we treated our bodies properly but one should also be grateful when

one was in good health. As one white male not eating the recommended servings suggested:

> Well, I think we should all thank God for our health. And I do. But I would say yes, I think it's
>
> important.

Health, as a value was seen as a manifestation of *God's will* where an understanding of God's will and

what was pleasing to God were the things that dictated or gave guidance for healthy actions. In this

variation of how *health* functioned, *God's will* determined what health actions should be taken. The

belief as expressed by participants was if you followed *God's will* then all other things will fall into

perspective, including health.

Responsibility as a Co-requisite for *Health*

The third variation of how *health* as a value functioned was in its connection to *responsibility.*

Participants suggested that to value *health* meant inherently meant valuing responsibility so that

responsibility was discussed as a co-requisite for *health.* Having good health was akin to being

responsible. An African American male's, not meeting the diet recommendation, viewpoint was that one

value (*health*) went hand in hand with another (*responsibility*). He explained that eating healthy goes

back to being responsible. Because:

If you are responsible you're not going to go out and do things that jeopardize your health, like alcohol and drugs. Part of growing older is growing wiser. You should be able to make better health decisions.

He further suggested:

If you're healthy there are some diseases that you are likely to avoid. I have never seen anyone who has lived to be 100 that is obese.

Because the intent or desire is to live longer then one needs to healthy. To be in good health as reflected by a long life and physical health meant acting in responsible ways. A female CRC survivor not meeting the recommendations also underscored the idea that to value and maintain *health* one has to be responsible for one's actions. She claimed:

I need to be responsible for myself, because – you know – where other people don't care, then I need to be responsible, because you can't depend on people to be responsible for you. So in order for me to take care of myself, I have to be responsible for myself.

A white male CRC survivor eating more than the recommended amounts also suggested that in relation to health:

If you don't help yourself, no one's going to help you. You know there's only one way it's going to happen. To get better, you got to do it yourself. There's no one to do it for you.

The idea here is that to expose *health* as a value means that one has to also value being a responsible person making wise choices and decisions. The individual has responsibility for their own health. Good health is not a static state but rather an active component where one has to exercise responsibility in caring for oneself. Additionally, attaining and maintaining good health is not the responsibility of others but rests on the shoulders of the individual. These explanations show *responsibility* functions as a co-requisite to *health*.

In sum, there were three variations of how *health* functioned in relation to other values. Table 26 shows which participants renderings corresponded to which model. The majority (N=12) of participants discussed the value *health* as a necessary component or prerequisite for fulfilling other values and functions. Six discussed *health* as a manifestation of *God's will* and three viewed *responsibility* as a co-requisite for *health*. In the first variation, where *health* was a necessary component for other values, participants were mainly CRC survivors (n=8), eating more than the recommended amount (n=7), white (n=9). There were an equal number by sex in this category. Those who viewed *health* as a manifestation of *God's will* were mainly CRC non-affected (n=4), all reported eating less than the recommended fruit and vegetable servings, African Americans (n=4) and female (n=4). Only three participants described *responsibility* as a co-requisite for *health.*

Table 26. Variations of Health as a Value by Participant Characteristics

	Total Number of Participants (N=21)*	Number of CRC Survivors	Number of CRC Non-affected	Number Eating ≥5 FV Daily	Number Eating ≤5 FV Daily	Number of African Americans	Number of Whites	Number of Males	Number of Females
Health as a necessary component for other values	12	4	8	7	5	3	9	6	6
Health as a manifestation of *God's will*	6	2	4	0	6	4	2	2	4
Responsibility as a co-requisite for *Health*	3	2	1	1	2	2	1	1	2

*Note: 3 participants did not fit the above models due to insufficient data regarding health and other values in their calls.
Key: FV=Fruits and vegetables

Figure 8. Relationships of the Value *Health*

Values as Health Promoting and Health Limiting.

The second main finding of this study was the dual function of values (see Table 27). Values as described by both CRC survivors and non-affected persons were characterized in both health promoting and health limiting ways. In particular, the values *independence* and *God's will* were ascribed these functions. First, *independence,* described as being able to meet one's own needs, in the context of eating more fruits and vegetables was talked about as both enabling and restricting one's ability to eat in a healthy way. One way participants discussed *independence* was that this value meant being responsible for one's own health and being able to do the things one wanted to do. Therefore in the absence of good health due to having a poor diet or illness (cancer), their independence was compromised. A distinction was made in the definition of *independence* which was also described as

being free from the control or power of another to fulfill health needs/goals. Second, *God's will* was

talked about as providing guidelines of how to live healthily but also as health limiting if too much

reliance was place on religious beliefs.

In relation to fruit and vegetable intake, *independence* was talked about in terms of staying

healthy to maintain current lifestyle for as long as possible, not wanting to be perceived as dependent,

and staying self-reliant in the absence of having family around to lean on. Eating fruits and vegetables

fit into the picture of being healthy because it was seen as one way to maintain physical independence.

Lack of independence not only affected individuals in terms of physical limitations but also there were

also emotional and social impacts. One male CRC survivor who also had a stoke months apart

described only after having cancer did he become concerned about what he ate:

And so I had gotten to notice that what I was just eating was more like a snack kind of

sandwich and then potato chips. And then that's when like I said, being home I had a chance

to really evaluate what I was doing. And now I can pay attention to keeping up with the fruit.

It's just as easy to pick up an apple as it was to pick up a bag of potato chips.

 He also admitted that:

And basically, all I've done is just added some fruits. Since I'm home [from the hospital], I'm

more conscious of what I'm eating now.

His illness prompted him to recognize the importance of eating well because being in poor health

impeded his independence in a number of ways. When asked about his most important values he

explained that:

Independence because I had to go through some therapy to recover a lot of the use with my

right side. And now there's the point to where, probably nobody knows it, then they won't even

notice it.

The surgery resulted in physical limitations but also had an emotional impact. Even though he had seen others in his family suffer with cancer, he observed, "*But my problem is that nobody seems to have had a problem adjusting like I did."* And that "*the emotional end of it is I had a lot..."*

Poor health also compromised one's independence by limiting opportunities for social interaction. For example, an African American cancer survivor mentioned because of her poor health she could no longer drive and that meant having to rely on others for rides. She said:

Well I went last night [to the revival at church] and the night before. And I go whenever I have a way of going." …But when night comes, most of the time. All the time, I'm at home, unless you know somebody carry me, carry me someplace.

A second theme evident when participants talked about what *independence* meant and its connection to their diet was that of having their own needs overridden. They often had to compromise what they ate based on their families' needs. However, when family members were not around due to having died or moved away, that freed them to do as they pleased. One way they were freed was now to eat in a healthier way. While they valued being independent, their ability to suit their own needs was not often met when it came to food choices because the preferences of others in the family dictated food purchases and consumption. An African American cancer survivor confessed that once her husband passed away and she was alone she was able to adjust her diet in a healthier way. She explained that:

When my husband lived, you know, most men they like a whole lot of red meat and stuff. So since he's passed and I'm by myself you know. I don't hardly ever eat any red meat.

Here she suggested the being able to meet her own dietary needs or interests in eating healthy was compromised while her husband was alive. Being independent for some was the key to eating in ways that were healthy and pleased them. Another African American CRC survivor expressed a similar sentiment:

Well, I stay by myself now. I made a step of moving out from my family, and I stay by myself. And being by myself, relaxing, reading, and playing my piano and singing and doing exactly what I want to do.

Later in the conversation she explained that:

…Because like when I am here by myself, I could grab a fruit you know. Or I could eat a bowl of vegetables, if I'm here by myself and I need something to snack on. I can do that.

The idea here is being in control of one's own life in every aspect including deciding what one includes in one's diet was easier to manage without having family intrude on those decisions. Yet the decisions about food choices do occur in the context of families and what one decides to eat may not be negotiated and one may just follow what the majority of the family wants. An African American grandmother who never had cancer explained that:

I have a tendency to buy a lot of stuff that the grandchildren want that live here and which is not vegetables...they do pretty good with fruit, so I end up buying things that they like...I eat it, too.

This duality of values functioning in health promoting and health inhibiting ways was also assigned to the value *God's will*. A number of participants talked about this value in the realm of taking care of one's body is to do *God's will*. Further that religious scripture provided a how-to manual for eating healthily, a reminder that the body is more than a physical being but a temple of God to be honored, and an assurance that God is pleased when we honor our bodies by taking good care of it. For example, an African American woman explained:

The Bible says you're supposed to present your body as a living temple and a living sacrifice. So if you're going to take care of it, you've got to eat healthy and eat right, and exercise and do things that are right.

In the above example, an understanding of *God's will* included an active component where the suggestion is that God empowers the individual to take healthy actions. On the other hand, for others, *God's will* may signify a more passive approach to action. If one's understanding that part of God's will includes a reliance on God to protect one's health rather than taking individual action this value may a inhibit healthy action. As one gentleman asserted:

I don't think that by doing all the physical things [eating more F/V] that you can on your own will be that beneficial...You put God first and that's where you put your confidence in. [You] put Him first in everything and everything else will work out.

In this sense, God's will can promote individual inaction to pursue healthy behaviors. Additionally, an African American man pointed out that in the service of doing God's will our own thinking and decisions that will benefit the body should not be clouded by religion views. He warned:

I think it's great that if you're involved in religion. I'm very much involved myself…but not to the point that it takes precedence, where it's going to jeopardize my life, my future. You know, people that believe that God's going to heal them refuse a blood transfusion. Let's get real. There are doctors out there that's what are they for, you know what I mean? You got to have basic common sense when you're dealing with these types of things. If you're going to let your religion overshadow that, you've lost it all. I feel that –personally – you've lost the ability to make good judgment.

Here the warning is that even though God's will may function to guide one in how to take care of one's body, placing too much emphasis on religion and/or God as a guide in one's life and how one takes care of one's body should not take precedence over common sense thinking when there is potential for harming the body. The idea here that maybe religion, when valued one the one hand may promote

health by giving guidelines for how to treat the body. On the other hand it may cause one to act in an illogical manner so one must guard against this when comes to health threatening issues.

In sum, participants described values as both functioning in health promoting and health limiting ways. Particularly, *independence and God's will* were deemed to have this dual quality. When endorsed, for some participants, a value may be seen as acting favorable to promoting health. In the case of independence, valuing and preserving one's independence was key as this prompted the individual to keep an eye on their health and to avoid poor health outcomes. On the other hand, other participants suggested that these same values worked to undermine eating more fruits and vegetables and thus health. In the example of independence, while participants valued their independence, when it came to health promoting decisions, they were not fully free to pursue healthy choices.

Table 27. Summary of Values as Health Promoting and Health Inhibiting

	Independence	*God's will*
Value definition	1) Being able to meet one's need (as given in the values clarification exercise) 2) The state of being free from the control or power of another (Merriam-Webster and how participant defined)	1) to follow God's plan for me (as given in the values clarification exercise)
Value as health promoting	1) When in good health: • Ability to maintain physical independence, enjoy things life has to offer 2) Away from family/living on own so can eat in health promoting ways	• Provides how-to manual for taking care of body as a temple
Value as health inhibiting	1) When in poor health: • Depend on others for fulfilling needs • Limits social interaction 2) Family preferences dictate eating in unhealthy ways	• Can be health inhibiting if misinterpret Biblical teachings and not use resources such as doctors when health threatened.

Patterns of Fruit and Vegetable Adherence

The third finding in this study highlights other reasons participants claimed for being adherent that is, following the fruit and vegetable guidelines as opposed to failing to meet them. The first two findings draw attention to the role individual values play in fruit and vegetable intake. When trying to account for what factors distinguished eating well, clear differences in adherence were not discerned based on: (1) values, that is, one value or a set of value accounting for greater adherence; (2) cancer status as both survivors and non-affected persons were in both categories; (3) race or (4) sex. As stated earlier, those who chose God's will generally were not meeting the guidelines but did not fully predict dietary adherence. Rather when participants were categorized by level of adherence (meeting vs. not meeting) then other factors may have been more predictive of dietary intake. The aim of this study was to understand how values functioned in fruit and vegetable intake. While the first two findings illustrate how values function in relation to diet, this finding highlights the role of other factors, including values that are important motivators for eating healthy. This study also characterized participant beliefs. Table 28 summarizes participants' beliefs and barriers influencing fruit and vegetable intake.

Participants' beliefs played a role in whether they met or fell short of the fruit and vegetable guidelines. As suggested by Sawa and Sawa (2001), part of understanding whether behavior change occurs as a result of a values clarification exercise is how knowing an individual's beliefs about their current behavior as compared with beliefs about the ideal level of behavior. When examining participants' beliefs, attitudes, motivations, and insights about their fruit and vegetable intake, a main distinction was discerned between participants who reported getting the recommended amounts of fruits and vegetables and those who were not rather than by cancer status, sex, or race. Table 28 below show factors each group attributed as influencing the fruit and vegetable intake. It is important to note that all participants indicated that they recognized or understood the importance of a diet that included fruits and vegetables. Half the sample was meeting the recommended levels of daily fruit and

vegetable intake. For these persons, the aging process, having a major illness like CRC, or the illness of a loved one, and wanting to prevent CRC recurrence motivated them to eat well. Beliefs about eating well were clearly justified. For example, knowing the kind of diet needed to be healthy and following that plan as one participant cited was based on following God's plan as out lined in the Bible. One's core value acted as a motivator for eating well. An African American CRC survivor who reported eating above the recommended servings stated:

> I think that the fruits and vegetables are really the only two foods that people need to eat to be healthy. I don't think they need meats. I don't think they need the other stuff...pasta and all that. I think they need only fruits and vegetables because if you go back to the Bible and the beginning with Adam and Eve they didn't have any meats. They had vegetables... fruits and for a long time people lived off of fruits, vegetables, and fish. They did not have all of these other things. And I think that we do our bodies harm even though I eat meat occasionally, but I think we do our bodies harm when we do eat it because of all of the different things in the meat that we know [is] not good for us. And every day we're finding out more and more that fruits and vegetables are the foods that we should be eating. If you pick up books on foods, they tell you that you know fruits and vegetables are very, very important. I think they have all the nutrients really that the body needs. And I think that you can clear your body of a lot of sicknesses by eating fruits and vegetables and leaving meat alone and all those greasy foods and stuff...I think that your body will say to you thank you.

It was clear that individuals' Biblical knowledge and belief that fruits and vegetables promoted better health was really a driving factor in their dietary practices. As shown above, it was beliefs underlying one's core value of God's will that influenced fruit and vegetable intake.

The willingness to continue to eat healthily had to be accounted for in the case of CRC survivors who in the face of having followed a diet rich in fruits and vegetables still got CRC. For one

survivor, who even though was not eating at the recommended levels, continuing to eat fruits and vegetables was the right thing because she insisted that *"I think what you eat really does have something to do with your health."* More so having evidence of a non recurrence of cancer was motivation to keep on eating fruits and vegetables. She commented that:

I am going to continue to eat [fruits and vegetables]. Because I tell you what, I ain't got no cancer now. I do not have it, when I had my check up in March I was cancer free.

An additional motivator to eat well for this survivor was to be a good role model for her family particularly her grandkids. Her beliefs about eating healthy were tied to her core value of *family.* She remarked that the link between why she continued to eat well and her values was, " *Well I am setting an example for these kids here."* She further explained:

I think it [eating fruits and vegetables] pays off in the long run. Because they are going to be healthier too. If they have cancer they are going to have a better chance of fighting it off because of the habits they learned right here.

An African American survivor, who did not have a family history of CRC and grew up eating plenty of fruits and vegetables, expressed confusion about getting CRC. She wondered:

I kind of don't understand, you know, why I got the colon cancer because I've always eaten a lot of fruits and vegetables.

Nonetheless, she reported eating above the recommended amounts perhaps in part as she stated, *"I feel like vegetables and fruit, too, are good for you."* And that she had been raised to eat in this way all of her life.

For this group who were eating the recommended servings of fruits and vegetables another key commonality was the idea most of them had made up their minds to do so and felt willpower played a role. In discussing whether they could increase the amount of fruits and vegetables they were already

eating, participants insisted that it was possible to eat more if they decided to. Seemingly there was an intrinsic ability to eat more because you could:

Just make it up in your mind that that's what you're going to do...cut out some of the other stuff

that you're eating and concentrate more on that [eating more fruits and vegetables].

 Even in justifying why they were eating at or above the recommended levels, most in this group said that they *"changed their mindset"* or was *"bull-headed and just made up my mind to do it."*

In contrast, individuals who were not eating the recommended fruit and vegetable servings but all expressed knowledge in the importance of eating healthy rationalized their behavior in a number of ways. For the group meeting the recommendations, the Bible provided clear instructions that one must treat one's body well. However, when the Biblical guidelines were discussed by a person not meeting the recommendations, they were talked about in terms of what one ought to or should do. A CRC survivor observed that:

The Bible says you're supposed to present your body as a living temple and a living sacrifice,

so if you're going to take care of it, you got to eat healthy, and eat right, and you know exercise

and do the things that are right.

 While the knowledge about what one was supposed to do was apparent, seemingly there was nothing apparent to bind a person to that commitment.

Another way that not eating enough fruits and vegetables was discussed was through admission that one knew one was not doing what was needed. As one White female participant who was eating below the recommended levels admitted, the inconsistency between her beliefs and behavior could be understood as *"Knowing and doing are two different things."* The event of knowing does not mean that actions will reflect that knowledge. Recognizing the discrepancy between expressing the virtues of fruits and vegetables and still not doing acting accordingly, many insisted that they were at least making an effort. For example, one participant rationalized that:

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It's not easy when you're living alone. You tend to don't even think about food 'til about 5

o'clock when you say oh...I wonder what I'll have for supper and usually I keep home made

soups frozen so a lot of times I'll end up with that but that has vegetables and meat in it. But I

am trying to eat a more balanced diet. So, I think that's a step forward.

This kind of justification was evident with a number of participants who pointed out that while they were

not reaching the ideal levels, they still made strides towards eating well and were simply not just

ignoring what was needed.

A common barrier to meeting the recommended guidelines was the notion that what was

recommended was more than one could accommodate in a day's meal. For example, a male

participant when asked his opinion about the recommendations remarked:

I'm sure that if you eat 5 to 9 servings each day, that's about all you're going to eat. I mean, I

don't think it could happen. It just seems like a lot.

Other barriers cited that prevented individuals from meeting the recommendations included being a

diabetic, dislike of certain vegetables and fruit, and CRC having affected one's appetite.

The discrepancy between believing in the benefits of fruits and vegetables and actually taking

advantage by following the guidelines was validated because of participants' own levels of self-

satisfaction with their current behaviors. For one male participant who reported on the baseline survey

getting about 3.7 servings daily, recounted that he is highly active and is in good health so with

regarding to his current level of fruit and vegetables he stated:

I am going to keep on doing what I am doing. If anything, I'll try and eat more vegetables. But

nah, I mean I've done this all my life, so nothing's going change any of those things.

For him, in the absence of illness and feeling satisfied with the amount of fruits and vegetables he was

currently eating, there seemingly was no reason to eat more. Self-satisfaction with one's current eating

level was also observed in the ways participants compared themselves with those they deemed to be in worse positions. An African American male recounted:

> You get older, you start thinking about your life and you say, wait a minute, why am I eating cookies and all this stuff. And one of the things is, when I look back and I go to my home and see people that I went to school with, or we have a school reunion, and I look at the health problems these people have and the problems I've had. I say, I don't really have a problem.

Similarly, individuals may perceive that the amount they were eating was sufficient because they have been focusing on their health and not neglected their health as some of their peers have. One African American woman not eating at the recommended levels explained that:

> Primarily I'm interested in good health because of friends and associates, people that I know in my age range. A few have passed and I thought that some probably passed when they maybe would have still been here had they gotten involved and started to be more concerned about their health and all. And especially what they eat. I'm a firm believer in the fact that in large parts you are what you eat.

For this participant she recognized that she was doing more for her health than others she knew. Even though she may not be meeting the recommendations there was no indication that her health was out of control that would warrant a change. She defended her inability to eat more fruits and vegetables by saying:

> I've always been a little health conscious. I've always been concerned about my weight, you know, although I haven't always done as much as I should have as to maintain it, but it hasn't gotten what I call...out of out of control.

Again, like some others in this group, there is no salient need to do more than what is currently being done.

Similar to participants who were following the fruit and vegetable recommendation, those who were not also cited doubts about the link between CRC and a diet rich in fruits and vegetables. Seemingly, participants were aware of general information regarding this connection. An African American male not eating at the recommended level mentioned:

Well I have heard some studies that said some of those fruits and vegetables will prevent cancer or something of that nature.

And others echoed the sentiment about not being fully convinced that fruits and vegetables prevented cancer. Another participant not eating at the recommended level said:

I know fruits and vegetables are good for you anyway, so you should eat them. So whether it's good for preventing cancer or not, it's still a good food for you.

To eat more fruits and vegetables, as the same participant explained would happen only:

If somebody told me I was going to get cancer if I didn't eat 9 cups of fruits and vegetables a day, I'd eat 9 cups of fruits and vegetables a day.

In part attitudes that substantiated why participants were not meeting the recommend fruit and vegetable intake levels stemmed from the belief that fruits and vegetables were not proven to prevent CRC.

Those not meeting the recommended levels also cited a similar determinant for changing their behavior-that of making up their mind. While those who were meeting the recommendations insisted that the "made up their minds" to eat healthily, those who were not contended that they too could eat more fruits and vegetables since it was just a case of mind over matter. As one participant, not eating at the recommended level, suggested:

I'm going to have to make up mind if I'm going to eat more fruits. I think I eat enough vegetables. But I'm going to have to work on my fruit. And I think it's a mind thing. I think you have to make up your mind that you need to do things like this before you're going to do them.

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In sum, several factors were cited by those meeting the fruit and vegetable recommendations as compared with those were not. For those meeting the recommendations, recognition of the importance of eating healthy, the value *God's will*, no cancer recurrence, and making up one's mind were factors cited as reasons for eating well. On the other hand, even though the importance of healthy eating was recognized, there were other factors that played a role in one's diet. God's will was thought of as suggesting what one ought to do but not what one must do. The disbelief that fruits and vegetables prevented cancer, barriers such as poor appetite and living alone, the perception that one's health was under control, being satisfied with the level of fruit and vegetable intake, and not making up one's mind to eat better were all ways participants rationalized why they were not meeting these guidelines. These findings suggest that while values function in promoting healthy lifestyles through improved diet that other factors may also account for the amounts of fruits and vegetables individuals eat.

Table 28: Beliefs & Barriers Influencing Fruit and Vegetable Intake

Persons Eating the Recommended Daily Fruit and Vegetable Servings	Persons Not Eating the Recommended Daily Fruit and Vegetable Servings
✓ Importance and knowledge of recommended servings acknowledged	✓ Importance and knowledge of recommended servings acknowledged
✓ *God's will*: Belief that Bible gives instructions for taking care of body in a healthy way	✓ *God's will*: Belief that Bible gives guidelines about what should do
✓ Confusion about getting cancer even though ate healthy. But no recurrence of CRC a motivator to continue to eat fruits and vegetables.	✓ Disbelief in link that fruits and vegetables prevent cancer
✓ Made up mind to eat healthy	✓ Barriers: chronic illnesses like diabetes, poor appetite, distaste of particular fruits and vegetables, living alone
	✓ Health under control or no major health problems discerned
	✓ Satisfied with current eating level
	✓ Had not yet made up mind to eat healthier

Discussion

The main findings of this study were: (1) the predominance of health as a value and participants' accounts showed three distinct ways in which *health* as a value functioned; (2) values functioned in both health promoting and inhibiting ways; and (3) in addition to values, beliefs about fruit and vegetable intake contributed to meeting the daily recommendations.

Health was believed to be important and was seen as encompassing more than diet. Participants defined health similarly to Smith's (1983) eudiamonistic model where health is viewed as wholeness in the complete development of the individual. Because health is the basic concept underlying public health research and practice, it is paramount that the meanings of health be clearly understood. How one envisions health may be related to health behaviors. For example, in a study of normal and overweight individuals, Lamprey (1985) health promoting behaviors were associated with the eudaimonistic health conception while illness-preventing behavior was associated with a clinical health conception (absence of disease or symptoms). The author concluded that conception of health may be a more significant factor than one's perceived health status for assessing health behavior. Other studies point to the importance of understanding individual's health beliefs and understanding of health in relation to their behaviors (Holt et al., 2005; James, 2004; Reedy et al., 2005; Wamsteker et al., 2005).

Health was also one of the most frequently endorsed values. Both CRC survivors and non-affected persons were similar in these aspects. Other studies have found that *health* became less important over time to cancer patients (Lampic et al., 2002 & Nordin et al., 2001). However, CRC participants in this study were on average 2 years beyond the initial cancer diagnosis. In this study, one factor that might have influenced the findings was that participants were sampled from the North Carolina Colon Cancer study, a case-controlled study of colon cancer. As such, participants may have had an increased attention to their health. Nonetheless, participants were highly reflective about the

meanings they ascribed to their core values. Indeed their meanings about how *health* as a value functioned has important implications for public health practice.

When the meaning of *health* as a value was discussed several other values (*independence, strength, mental strength, family, and helpfulness*) were mentioned as being fulfilled if one was in good health. Here *health* was considered as a necessary component for other values endorsed. As these findings imply, the value *health* was connected to fulfilling other values and was seen as a part of other goals (e.g. living longer and better). One practice implication this suggests for health promotion efforts is for practitioners to explore with clients/patients in greater depth the potential array of benefits a particular value might hold apart from its definition. By allowing multiple linkages to be explored, the additional benefits previously unacknowledged may surface providing patients a greater sense of the benefits of pursuing the health promotion effort and strengthen motivation.

The religion-health connection was also raised and is an important area for further exploration. The value *health* was linked to *God's will* where *health* was a manifestation of *God's will*. Unlike in the previous variation where *health* served as a necessary component for other values, *God's will* determined how participants viewed actions related to *health*. The idea of the body as the temple of God was usually cited as a scriptural basis for pursing healthy acts. However, even those who were not meeting the recommendations referred to treating the body well to please God and as something they believed they should do. Previous research suggests that scriptural teachings might the basis of why many people lead a healthy lifestyle or engage in healthy behaviors and avoid unhealthy ones (George et al. ,2002; Levin & Vanderpool, 1989; Strawbridge et al., 2001). However others (Ferraro & Albrecht-Jensen, 1991) indicate that spiritual beliefs can influence health beliefs and behaviors in both positive and negative directions. As one study participant hinted, spiritual beliefs should not overshadow taking individual action when one's health is threatened. In other words, while God empowers the individual to take healthy actions, one should not endorse a "passive approach" relying on God to take care of

their health rather than taking individual action (Holt et al., 2003). While not evident in this study, possible negative effects of religion and health should be explored in future studies. This line of research could serve to highlight mechanisms through which religion might affect health. The degree of adherence to religious teachings may also highlight features of the value-health connection. There seems to have been a slight distinction for persons meeting the recommendations and those who were not. Those who met the dietary guidelines fully affirmed that God expected one to take care of one's body whereas, those not complying with the recommendations, the body-temple connection was talked about as what one should do.

The notion that if one is to value *health* meant then one must also embrace *responsibility* as a value was discussed. *Responsibility* was a co-requisite for *health.* This example raises the question about the nature and function of values in relation to other values. Does this mean that some values are interlinked, whereby endorsing on value means embracing the other if one is to act in a value-congruent manner? Is this a conscious decision or not? Rokeach's (1973) conceptualization of values existing within a hierarchy suggests that actualizing one value may mean blocking another (Grube et al., 1994). However, these findings raise significant questions about the overlapping nature of values.

The second major finding was that values functioned in both health promoting and inhibiting ways. Specifically, *independence* and *God's will* encompassed this duality of function. For example, on the one hand, *independence* in relation to staying healthy allowed for one to do the things one enjoyed. On the other hand, *independence* was jeopardized when the needs of family controlled/dictated how a person ate and usually it was in unhealthy ways. This finding has implications for how values-clarification is done in intervention studies. It points to the need for participants to construct and discuss their values and meanings. NC STRIDES described *independence* as the ability to meet one's own needs. While this definition held true, participants also talked about *independence* (rather the lack thereof) as being under the control of others so that their eating habits were hindered. By allowing

participants to discuss what each of their top values meant, it was evident that in the case of the value *independence* and *God's will,* an added dimension was brought to light by participants. An important implication for practitioners conducting values clarification exercises with patients, is to explore how the values endorsed may be both health promoting and hindering. This may allow researchers to examine in greater depth what barriers exist that hinder individuals from living in values congruent ways.

The third finding was that in addition to values, specific beliefs about fruit and vegetable intake were a determinant in meeting the daily recommendations. The main differences were noted for those meeting the recommendations versus who were not rather than by cancer status, sex, or gender. Both groups acknowledged that fruits and vegetables was an important part of being healthy. However, beliefs and attitudes varied. One factor involved the diet-cancer connection. Those who believe in the link between diet and cancer have been found to be more likely to make healthy changes in their diet (Patterson et al., 1996). For cancer survivors meeting the recommended fruit and vegetable levels, there was expressed confusion about why they developed cancer in the face of having eaten a diet rich in fruits and vegetables their entire lives. Even though there was skepticism about the diet-cancer relationship being true, several CRC survivors took the approach that they would continue this healthy habit anyway because so far the cancer had not returned. In contrast, a few participants (both survivors and non-affected) not meeting the recommendation denied that such a link existed. Rather for them to comply with the recommendations would mean there must be hard scientific proof. The idea that fruits and vegetables were good for you regardless of the connection to cancer was also voiced by both groups.

While there is mounting evidence about that diet is a strong lifestyle risk factor for colorectal cancer (Riboli & Norat, 2003, Vainio & Bianchini, 2003, Slattery, 2000; Voorrips et al., 2000; Potter, 1999; McMichael & Giles, 1994), the level of uncertainty that eating fruits and vegetables is the way to really prevent cancer among this sample was strong. The findings suggest that research community

may have to have a uniform message about the role of diet and cancer. Indeed a longitudinal analysis of beliefs and dietary choices made at different points from diagnosis onward may shed more light on better understanding why some survivors comply with the recommendations and others do not.

Those not meeting the recommended level of fruit and vegetable intake were more likely to cite illness, poor appetite, distaste for particular foods, and living alone as barriers for rationalizing why they were not eating as they should. Another factor for not eating the recommended servings was the belief that one's health was under control and there were no health concerns that warrant changing current behavior. Additionally, they had made some attempts to their current diet and were satisfied with their efforts. These finding points out the need to understand what other health promoting efforts participants have done and what strategies were used for incorporating those changes. Participants' recognition that diet is not only component of a healthy lifestyle may mean that they appreciate other dimensions of health other than diet. For example, one participant, not meeting the fruit vegetable dietary intake guidelines, continually referred to his bike riding habit throughout the interview. As such, participants may see that because they have made changes in other areas such as exercise, eating less red meat, or cutting out junk food as progress in the right direction. So getting the recommended servings may not be as pressing (since there may also be barriers to eating FV such as taste, illnesses like cancer and diabetes). An area for future research to consider is beliefs about whether substituting one health behavior protects you from another.

A final distinction for those meeting the recommended serving levels versus those who were not was the idea of making up one's mind. Those meeting the recommendations pointed out that they indeed had "made up their minds" to eat healthy and as such were able to do so. Seemingly, to make up one's mind was an innate human quality and one simple had to decide to do so and the behaviors followed suit. The sentiment is somewhat similar for those not meeting the guidelines. Many voiced that they had not made up their minds and as such were not engaging in the proper ways of eating well.

Other studies have referred to the lack of willpower as a factor in changing diet (Ziebland et al 1998; Lappalainen et al., 1997). However, in this study, making up one's mind seemingly was more in the realm of making a decision rather than not having the wherewithal to do so. More research is needed on a larger scale to sort out the underlying meanings and factors related to "making up one's mind" and eating a healthy diet.

There are some study limitations that should be acknowledged. The population under study was previously enrolled in another cancer study two years before recruitment into the NC STRIDES study. As such, study participants may represent highly motivated individuals who may not be representative of the general population. Sampling individuals from a previous cancer study may also have primed these individuals to be more health conscious. However, participants were highly reflective about the meanings of values and their diet. Questions that might have rendered a more complete understanding of the relationship between values and diet were not included. For example, CRC survivors were not asked to describe their values prior to their diagnosis or some prior point in time. Nor were CRC non-affected individuals asked to discuss their values prior to a major illness or some prior point in time. In essence, the study provides a cross-sectional view of the values-diet relationship and the opportunity to assess of any longitudinal relationships was lost. Nonetheless, one strength of secondary data analysis, is the ability to shed light on stronger methodological needs and new directions for research.

Several study strengths also exist. The sample included a demographically diverse population in terms of race and colorectal cancer status. This diverse sample allowed for comparisons of colorectal cancer survivors with non-affected persons to assess health behaviors of colorectal cancer survivors-- a group about which little is known about their health needs and issues. This is the first study of its kind to attempt to understand how values function in promoting fruit and vegetable intake. The findings are important as they may help to clarify how values may act as motivators for behavior

change. The qualitative nature of this study allows from richer explanations of the relationships

between diet and values beyond what quantitative measures may provide.

CHAPTER SEVEN

DISCUSSION

Overview of Main Findings

The purpose of this research was to identify the potential role of individual core values in fruit and vegetable intake. In the first paper, the aims were to describe and compare the values and fruit and vegetable consumption of CRC survivors and non-affected persons; and (2) to examine the role of values in promoting fruit and vegetable consumption over time. All analyses were conducted using SPSS version 13. The most frequently selected values were *family, health,* and *God's will* respectively. Similarly both CRC survivors and non-affected persons endorsed these top values. However, the only statistically significant relationships based on CRC case status were for the values *responsibility* and *friendship* where non-affected persons were more likely to select these values compared to cancer survivors. There were differences in value selection by gender. Men were more likely to endorse *responsibility* as a value compared to women. Women were more likely to select *inner peace* compared to men. Race, sex, level of baseline fruit and vegetable intake, and intervention group were not statistically associated with endorsing a particular value. Surprisingly, none of the proposed hypotheses were supported. Being a cancer survivor did not predict selection of *health* as a value or selection of instrumental values (modes of conduct) rather than terminal values (representing end states of existence). Similarly, neither selecting instrumental values nor *health* predicted increased fruit and vegetable consumption. However, only CRC status was predictive of fruit and vegetable increase at follow-up. In this instance, it was individuals who did not have CRC who had a significant increase in

the fruit and vegetable intake at follow-up. Finally, selecting instrumental values was not a predictor for reporting higher importance and self-efficacy for fruit and vegetable intake.

The second paper used a qualitative case-comparison approach to examine how values functioned for colorectal cancer survivors and non-affected persons at different levels of fruit and vegetable consumption. There were three main findings. The first finding pertained to the value *health* one that was most frequently endorsed. Participants discussed *health* as encompassing more than diet. Additionally, participants perceived health as functioning in three distinct ways. One variation was *health* was a necessary component for other values. That is, having good health meant fulfilling or being able to attain other values. A second variation was that *health* functioned as a manifestation of *God's will.* That is *God's will* determined how participants viewed actions related to health. A final variation was that the value *responsibility* was a co-requisite for *health.* To endorse *health* meant that one must also be responsible.

A second finding was that values functioned in both health promoting and health limiting ways. Particularly *God's will* and *independence* were perceived as having these dual functions in relation to diet. Finally, in attempting to understand what factors accounted for fruit and vegetable adherence, barriers and beliefs seemed more predictive than categorizing participants based on values, sex, race, and CRC status.

The Role of Values

These data provide a complicated story about the role of values in behavior change. While the analyses conducted in Study One did not provide evidence supporting the relationships between values and fruit and vegetable intake, case-comparison analyses in Study Two underscored that values do influence diet. The latter study highlighted the variations of how participants perceived the value *health* to function. Based on the findings of this dissertation research, it is important to understand and

take into account the ways that populations think about health. Beyond what values participants

selected, it is also critical to understand the meanings attributed to the values. Inherent in those

meanings are how beliefs, barriers, and motivations affect behavior. For example, participants

considered health in a holistic sense--a departure from the study definition of health as being physically

well. This broad conceptualization of the meaning of *health* as a value may be one indication of why

participants discussed other values within the framework of health and in relation to their fruit and

vegetable intake. As seen in Study Two, there was not one unifying theme regarding how *health* as a

value functioned but rather three variations. The ways participants understood health were pivotal in

their accounts about their rationalizations, beliefs, and attitudes about the amounts of fruits and

vegetables in their diet. Additionally, the value *health* when discussed as a necessary component for

other values suggested that other values were contingent upon *health* as a value being actualized.

This relationship suggests that perhaps a combination of value preferences may influence a specific

behavior. For example, as participants pointed out if they were in poor health then other values like

being independent, helpfulness, and enjoying family would be compromised. Therefore improving or

maintaining a diet with ample fruits and vegetables may not only be influenced by having *health* as a

core value but other values that relate to health. That is, the choice of a behavior (e.g. improving fruit

and vegetable intake) may be guided by the interplay of the influences of the activated values

(Schwartz and Inbar-Saban, 1998). As such, further research is needed to understand how clusters of

health related values and health role variations impact health behaviors.

Another role that values play in health behavior change, as highlighted by this research,

regards the health promoting or health limiting nature of a value. Participants' meanings attributed to

the values they endorsed suggested whether the behavior (eating more fruits and vegetables) was

actualized. Primarily, *God's will* and *independence* were values that participants discussed as having a

dual function. Each value either promoted or opposed eating fruits and vegetables according to the

ascribed meanings. For example, for some participants *God's will* was understood as empowering the individual to take healthy actions. Alternatively, other participants suggested that God's will included a passive reliance on God to protect their health rather than taking action for themselves. Each viewpoint has implications for taking health-related actions. Therefore, understanding whether participants' values function in health promoting or health limiting ways may be beneficial in predicting behavior.

In this dissertation research, an interesting finding related to both values and value type. Both CRC survivors and non-affected persons endorsed similar values as their top values, but there were differences by specific values (*responsibility and friendship*). However, there was no statistically significant difference by value type (instrumental vs. terminal). The distinction between instrumental and terminal values was not provided to study participants. Other studies point out that individuals do not distinguish between instrumental and terminal values (Heath and Fogel, 1978). Therefore, this attribute of values may not have been relevant to participants' discussions and understandings of how their values relate to diet. However, men and women did choose different values. This dissimilarity may be reflective of gender differences in perceived social roles. Women were more likely to choose inner peace. A prevailing description of what inner peace meant included the idea of creating balance in one's life. Men, on the other hand, were more likely to choose responsibility.

To further understand how values function an attempt was made in Study One to identify a structure among the 18 values used in the study by assessing the strength of the correlations. No distinctive clumping of the values resulted. There were 19 significant correlations but the strength of these was small. Other researchers (Rokeach 1973, 1974; Dwyer 1974) have also attempted factor analysis with 18 terminal and 18 instrumental values in the Value Survey Form (Rokeack, 1973) and have failed to produce any significant structures. In this study, the value *strength* was positively correlated with *mental strength* and *health*. One reason for this association may be participants' conceptualizations of health as including both physical and mental dimensions beyond diet.

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Additionally, the population under study was older (mean age 67 years) and as such issues of physical and mental capabilities may have been more salient.

Colorectal Cancer Survivorship

Jointly, the two studies paint a more complete picture of this sample that included significant numbers of CRC survivors and a similar comparison group. Of note is the finding that not having had cancer was predictive of fruit and vegetable increases but not values (value type nor specific value). Previous research has suggested that a cancer diagnosis acts as a cue that leads to changes in health behaviors such as diet (Blanchard, 2003 and Demark-Wahnefried et al., 2000). Satia's (2004) comparison of the North Carolina Colon Cancer Study and the NC STRIDES study population found that vegetable intake increased between these survey time points among survivors. It is conceivable that the diagnosis of cancer may have been a critical prompt for health behavior change (Rowland and Massie, 1998). However, perhaps once the psychological distress associated with the diagnosis and treatment had dissipated and survivors were several years beyond the cancer initiation, CRC survivors in this study may have returned to pre-diagnosis behaviors. An alternative explanation may be because CRC survivors had already made significant changes (Satia, 2004) and this may have created a ceiling effect for further change.

Another issue relevant for consideration is the age of the population under study. The mean age of this sample was 67 years. Half of all cancers occur in those who are over 65 years and incidence increase dramatically after age 60 (Greenlee et al., 2001). While a cancer diagnosis may be particularly significant for the health of older adults, the presence of other age-related co-morbidities may also be of concern (Havlik, et al., 1994). Some studies have found that quality of life for cancer survivors returns to a level that mirrors those with no history of cancer after treatment completion (van Tulder et al. ,1994; Kemeny et al., 1989). It may also be critical to explore longitudinally whether health

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behavior practices of cancer survivors post-treatment do indeed mimic those in the general population. It is fair to suggest that aging issues (such as comorbid conditions) may have created more equality between the CRC survivors and non-affected individuals regarding values selected and fruit and vegetable intake levels, given that CRC survivors were about 2.5 years post diagnosis.

Beliefs about the diet-cancer relationship may also contribute to whether survivors adhere to diet recommendations to reduce recurrence. Wold and colleagues (2005) found that cancer survivors (including CRC survivors) underestimated the importance of known behavioral factors such as physical inactivity and obesity as being associated with increased cancer risk. Diets that are low in fruits and vegetables are a known risk factor for developing CRC (Giovannucci, 1992). This research points out that the message regarding diets rich in fruits and vegetables as important for preventing CRC may not be believed by cancer survivors. In Study Two, CRC survivors expressed confusion about why they developed cancer given they had eaten a diet rich in fruits and vegetables prior to the diagnosis. Even so, some CRC survivors expressed hope that a non-recurrence of cancer was motivation to continue to eat healthily. Additionally, survivors expressed that while eating fruits and vegetables may not prevent CRC, this habit may confer other benefits. For some participants (both survivors and non-affected) not meeting the fruit and vegetable recommendation, skepticism about whether fruits and vegetables prevents CRC was stronger. Rather for this subgroup to comply with the current diet recommendations would mean having robust scientific evidence that fruits and vegetables did indeed prevent CRC. This finding suggests that diet messages should be framed differently. Rather than overplaying the role of diet in CRC prevention, other health benefits could also be highlighted.

Limitations

   This dissertation had several possible limitations. First, during the values clarification exercise,

participants were not asked to rank their top three selected values. Ranking values is an indication of

the hierarchal nature of a person's value systems. Inferences may have only been limited to referring to

the values selected as important without knowing which of the three values was most important.

However, selection of the top three values did allow for a gross estimate of what was important to the

individual. Further, due to the qualitative nature of the data collection procedure, there was some

opportunity to further glean which value may be the most important from participants' conversations

during the tailored motivational counseling calls. Still, ranking may be preferable as it can provide a

more extensive view of the value system. Second, the population under study was previously enrolled

in another cancer study two years before recruitment into the NC STRIDES study. As such, study

participants may represent highly motivated individuals who may not be representative of the general

population. Additionally, the window of opportunity to intervene with this population may have been

missed given that survivors were several years post-diagnosis. Finally, baseline fruit and vegetable

intake in the study population was higher than national estimates. Therefore, increases in fruit and

vegetable intake over the intervention period may have already neared the upper threshold.

Strengths

   Despite these limitations there are numerous strengths for consideration. First the sample

included a demographically diverse population in terms of race and colorectal cancer status that

increases the generalizability of the results. This diverse sample also allowed for comparisons of

colorectal cancer survivors with non-affected persons to assess health behaviors of colorectal cancer

survivors- -a group about which little is known. Second, data were available for fruit and vegetable

intake at two time points allowing for the assessment of change over the 12-month intervention period.

Third, given that the use of secondary data analysis may provide numerous constraints as the data collected was not done with the intention of answering secondary aims, it is advantageous to use multiple methods as done in this dissertation. Additionally, the use of qualitative and quantitative data sources allowed for triangulation of results and a broader understanding of the role of values in health promotion. Combining qualitative and quantitative methods was useful in examining the potential role of values in dietary intake. For example, *health* was one of the most frequently endorsed values. By employing qualitative methods, added dimensions were discerned of how *health* functioned beyond the quantitative relationships explored.

While the use of secondary data may be limiting, it is also an inexpensive and non-obtrusive way to explore important public health research questions. Understanding factors important in CRC survivorship is an area that is still relatively understudied. As this study suggests, the meanings and the roles individuals ascribe to particular values may be more important for understanding values may be motivators for health behavior changes. Therefore, future research may rely on more qualitative understandings to predict health changes.

Implications for Public Health

The health behaviors of cancer survivors are important for the prevention of cancer recurrence (Pinto et al., 2000). Understanding how and which values motivate and influence health behavior practices can impact how interventions are designed. Currently, there are no published studies that look at how personally held values relate to cancer preventive behaviors among colorectal cancer survivors. With the population of cancer survivors living longer than before, due to continued advances in early cancer detection and treatment, along with the aging of the population, the need for understanding lifestyle factors and health promotion will be in greater demand. It is suggested that the new and evolving paradigm of cancer survivorship looks beyond treatment and has an increased focus

on interventions that optimize health and well being (Aziz, 2002). This study contributed to the dearth of knowledge regarding this population and health issue.

Future research that includes a values self-confrontation exercise should allow for participants' explanations of the meanings of values endorsed along with how the values relate to the health behavior of interest. The values self-confrontation exercise provides an opportunity for individuals to reflect upon, reassess, and define how their health behavior goals fit with their current behaviors and to reveal any relationship between health behavior goals and their values. This process allows for greater self-knowledge about an individual's motivation in his or her efforts to affect behavior change. The results of this study do not suggest that values clarification be a stand alone intervention or that values be the focal point of a behavior change intervention. Rather, values-clarification may be best embedded within interventions that offer other health promotion strategies. The values clarification served to raise participants' awareness about their value hierarchies and to help participants put in perspective how their values influence their diet. Almost all participants discussed how their values played a role in their dietary choices. However, the degree to which values influenced their choices was not determined. As reported in Paper One, values did not account for changes in increases in fruit vegetable during the intervention. However, in Paper Two, it was evident from the MI counseling that values accounted for the ways participants conceptualized their health and thus eating patterns.

For CRC survivors, the diagnosis was pivotal in prompting change and values were discussed as playing a role in thinking about their health and rationalizing change. For the CRC non-affected individuals, values were also a part of their accounts for how they viewed their health. This research suggests that values should be included in studies where the attempt is to raise awareness of whether people health behaviors are congruent with their values and belief systems. Additionally, values confrontation may be useful as cues to action where individuals are able to reflect on whether their values would serve to help motivate them to participate in health fulfilling acts. This finding is similar to

Schwartz and Inbar-Saban's (1988) suggestion that the use of a values self-confrontation method for weight loss programs may be used at the beginning and reinforced at a later time point during a comprehensive health promotion program. The rationale is that value confrontation helps to "anchor motivation in a new set of value priorities that can guide specific behavioral decisions in the desired direction" (p.404). And it is this motivation that a comprehensive program can build upon. Improving our understanding of values influence and when to use a value clarification exercise may increase the effectiveness of healthy diet promotion interventions.

One promising area of work in motivational interviewing that may be applicable to understanding behavior change and values is that of assessing commitment language. Amrhein's (2003) psycholinguistic analysis of individual's talk relating to desire, ability, reasons, and need in motivational interviewing counseling sessions predicted strength of commitment language which in turn predicted behavior change (drug abstinence). The strength of the individual's perception of the importance of change and confidence in achieving change is presumed to underlie his or her commitment to change and to be observable in speech during the counseling session (Amrhein, 2003). Other studies have reported an empirical link between expressed commitment by individuals and their subsequent behavior for a number of behaviors including treatment compliance (Finney et al., 1985), drug addiction (Hall et al.,1991), and eating disorders (Mussel et al., 2000). Similarly, commitment language could be assessed during the values self-confrontation exercise when individuals discuss their values in relation to the target behavior. Commitment language in this instance could possibly expand our knowledge of behavior change as the values self-confrontation exercise can reveal behavioral discrepancies and in doing so also uncover goals and reasons for change related to individual core values.

Conclusion

Individual core values may be important to understanding and predicting behavioral decisions. This dissertation, presented in two manuscripts, examined the relationship between values and fruit and vegetable intake for colorectal cancer survivors and non-affected persons. In the first paper, logistic analyses provided no evidence supporting relationships between values and fruit and vegetable intake. In the second paper, case-comparison analyses underscore that values do influence health behavior. The MI calls including values clarification served to raise participants' awareness about their value hierarchies and helped establish how values influence their diet choices. Future research should explore participant ascribed meaning to values in tandem with how the values relate to the health behavior of interest. Understanding how and which values motivate and influence health behavior practices can impact how interventions are designed to promote cancer preventive behaviors.

APPENDICES

APPENDIX A: Case Summary Descriptions

Case #	1
Sex	Female
Race	African American
Case Status	CRC Non-Affected
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	10 I think they need only fruits and vegetables because if you back to the Bible and the beginning with Adam and Eve they didn't have any meats...they had vegetables... fruits and for a long time people lived off of fruits, vegetables, and fish
FV Confidence Rating	7 More aware so will now eat more. -Also knows herself so able to do it. Don't think will do 100% but know can ease up to that level. -Can do so by making up her mind. Cutting out some other stuff and concentrate on a healthier diet. - if you put your mind to anything you can you can just about accomplish it.
Values and Connection	Helpfulness inner peace Helpfulness: part of being a good person. You realize you are able to help those not as fortunate and you feel good about it. Makes your life better. -Part of your religion is to reach out to others Inner peace: the way you feel about yourself. Knowing you were able to help someone else
FV amounts	Current: 4-5 servings/ veggies, 2-3 servings/fruit Baseline 6.9 servings Follow-up 13.28 servings
Beliefs & attitudes about FV	Based on the Bible F/V are the only 2 things people should eat. Meat does the body harm. Even though she eats a bit of meat. Every day we're finding out how important & healthy FV are for our bodies. FV helps rid body of sicknesses. Our bodies will say thank you if we just eat FV, leave the meat and greasy foods alone. -Fertilizers not good for your body. Need natural foods. Hard to tell what farmers feed animals these days. -Interested in natural foods. Into green barley-that's supposed to cleanse the body. I think that when you take care of your body, you're mentally alert and physically alert
Function to F/V Intake	I think a person who eats fruits and vegetables, [is] taking care of his body mentally and spiritually. Have inner peace. B/c you're healthier and able to do more.
Motivator(s) for F/V Intake	-Bible -Not sure what animal farmers are feeding animals we eat
Barriers to FV intake	None given

Case #	2
Sex	Female
Race	African American
Case Status	CRC survivor
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	10 Thinks the more FV a person eat the better it is for you.
FV Confidence Rating	10
Values and Connection	Spirituality: has been attending a revival at church. Can only attend when gets a ride. Says is independent during the day but doesn't get out much at night unless someone available. Knows not able to do what used to do so just has to be satisfied when what she has. Independence: did not describe Loving: did not describe
FV amounts	Current: 8 or 9 servings/day Baseline 8.6 servings Follow up 8.17 servings
Beliefs & attitudes about FV	-not too picky about types of fruits and vegetables, likes all kinds -cooks for herself. Her husband has passed away. -eats more FV now since has seen programs on TV about FV and cancer. -Questions whether able to eat a little red meat since she has had colon cancer.
Function to F/V Intake	Did not describe
Motivator(s) for F/V Intake	likes to cook and eat all kinds of fv -likes to go the farmer's market during the summer -Since husband has died, she has had little or no red meat. B/c husband like red meat used to cook this a lot. - eats more fruits and vegetables now since has seen programs on TV about fruits and vegetables and cancer.
Barriers to FV intake	-no longer strong enough to have a garden

Case #	3
Sex	Female
Race	African American
Case Status	CRC non-affected
Intervention group	Combined Intervention
FV Importance Rating	10 Nothing really negative about fruits and vegetables except some have a lot of acid and that might be hard for some to handle.
FV Confidence Rating	8 Depends on willpower and she thinks she has willpower. -More willpower and seeing a continued result [weight loss, energy levels] will push confidence higher. Uses analogy of working at same job without raise.
Values and Connection	Faith "I think ..there's no harm in prayer and I think you could attach with my beliefs...and a combination of all of it ..I think what makes the whole."
FV amounts	Current: About 3 servings daily Baseline 3.4 servings Follow-up 6.4 servings
Beliefs & attitudes about FV	Fruits and vegetables gives more energy - when you're not eating right a lot of times you just want to do nothing but watch TV. Get sluggish -Likely to neglect eating kinds of fruits that you might react to e.g. itching
Function to F/V Intake	B/c of beliefs and looking at the body as being a temple, fruits and vegetables very importantt; when stop and think about your body being a temple and you want to keep holy ah that in itself… is a reminder you know of some of the things you need to do on a daily
Motivator(s) for F/V Intake	-Friends and associates have died, also people in her age range. If some had paid more attention to their health they would have been alive. -Wants to live as long as she can -Turning 59yrs old so thinks this is a good time to refocus on health -Knows people younger that she is that passed away. -Always has been health conscious in terms of weight. Admits hasn't done as much as should to keep it in check. But it isn't out of control. -past problems with blood pressure and being put on a strict diet when in her 30s..."the pressure it went down and it became normal and I never forgot that either" -believer in health diet b/c she is a "witness". BP went down after 1800/day calorie diet -father also suffered with high BP and learned from what he went through. His diet kept his health under control.
Barriers to FV intake	

Case #	4
Sex	Female
Race	White
Case Status	CRC Non-affected
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	10 Because it helps your health…helps keep you regular...and just healthy...it's just the thing to do
FV Confidence Rating	7 - try every meal to get fruits and vegetables in....and is branching out a little bit more. Never used to eat beets but friend urged her to try it and liked it.
Values and Connection	Friendship health Helpfulness Inner peace Friendship: Having close supportive friends important when you live alone Health: When you're living alone. Want to be able to take care of myself so I'm not have to be a burden on anyone. Inner peace: to keep calm, so able to function better
FV amounts	Current: tries to eat fruit and vegetables daily -know doesn't get 5 servings Baseline 3.6 servings Follow-up 4.85 servings
Beliefs & attitudes about FV	It just keeps your body functions going. -Could eat more vegetables than currently does but limits herself -Tries to eat the raw veggies she doesn't like -limits some fruits because of borderline diabetes but still trying to get at least 3/day - Knowing and doing are 2 different things. But I am doing better
Function to F/V Intake	Health is the only value that connect to FV intake
Motivator(s) for F/V Intake	None described
Barriers to FV intake	Diabetes -living alone

Case #	5
Sex	Male
Race	White
Case Status	CRC survivor
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	5 -b/c do pretty good at it already. -Wouldn't hurt to do better than what he's doing now. Some benefit to change but doing well now.
FV Confidence Rating	10
Values and Connection	Loving, family, strength (physically fit), health. Connection with eating fruits and vegetables. Loving: Love and support from family important. Family: Very important because we all need our support. And our families count on us to support them. Health & Strength: firm believer that as you age, if don't maintain your strength, you become something less than you were. You can't do what you want to do. So need to work at becoming physically fit then maintain strength and can do things into a nice ripe age. This is more important now as he gets older than when was younger.
FV amounts	Current; 2-3 servings/day, normally every day will have a serving or two of veggies Baseline 2.5 servings Follow-up 3.85 servings
Beliefs & attitudes about FV	Heard that fruits and vegetables may help prevent cancer but not sure if he believes that. -knows FV good regardless but not sure if there is a cancer link -important to eat a decent menu of foods if you're going to be physically fit, have energy. You just can't eat junk all the time. Can't eat hamburgers b/c too much saturated fat. Survived cancer so don't want to die from a heart attack. -thinks 5-9 servings is too much and wouldn't be able to eat anything else. Have to have a balanced diet. Couldn't just eat FV. 5-9 is just an awful lot.
Function to F/V Intake	Values chosen are all positive things. FV and being positive about things are things that make you survive. Have to be positive about health, positive if ill or else won't recover. And all those things are positive things.
Motivator(s) for F/V Intake	If had positive information that FV really made a difference there would be no problem moving it up. -if someone said he would get cancer if he didn't eat 9 cups of FV/day then he would eat 9 a day. Information needs to be compelling. Survived cancer so don't want to die from a heart attack. As he gets older, he thinks about being healthy more and more
Barriers to FV intake	Amount recommended seems like a lot. He wouldn't be able to eat anything else but the 5-9 daily. Eating just fruits and vegetables only does not constitute a balanced diet.

Case #	6
Sex	Male
Race	White
Case Status	CRC Non-Affected
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	7 Grew up eating fruits and vegetables and it's just something he likes.
FV Confidence Rating	7/8 If decided to then could do
Values and Connection	God's will=spirituality , family No connection God's will (tied with spirituality at # 1): Goes to church regularly. Is an elder in the church. Feels committed to God and the work of the church. Spirituality: Sees this as tied to God's will and goes hand in hand. Attends Bible study once per week. Family: Very important. Don't know what would do without wife and children. Main thing in life is prayer and worshipping God, attending church. Should be in everyone's life.
FV amounts	Current: 2 servings/day Baseline 1.6 servings Follow-up 2.00 servings
Beliefs & attitudes about FV	-thinks important in the diet -likes fruits and vegetables -Thinks fruits and vegetables recommendation is a lot. Thinks if eat about 2-3 servings it's already a lot. Have made changes in how food is prepared. No longer uses fat back to flavor foods because of cholesterol problems.
Function to F/V Intake	Not sure there is a connection. Believes in the power of prayer to help him feel well. Should always thank God for our health.
Motivator(s) for F/V Intake	If know that fruits and vegetables would keep him from getting a life threatening disease then will probably more up in importance. -No cholesterol in fruits and vegetables unless cook them wrong. More nutritious therefore easier to eat. Have high cholesterol so has to watch greasy food intake so careful about having healthier foods. Eats a lot more salads now and less meat.
Barriers to FV intake	Not discussed

Case #	7
Sex	Female
Race	White
Case Status	CRC Survivor
Intervention group	Combined Intervention
FV Importance Rating	10 Very important FV good for you.
FV Confidence Rating	10 Very confident
Values and Connection	God's will, loving, family No connection God's will: Christian so all her life wanted to do God's will and have prayed to do so. Loving: something we all should do. Family: love family and pray for them everyday.
FV amounts	Current: Eating 7 servings fruits and vegetables daily. Don't eat much meat. Baseline 7 servings Follow-up 6.45 servings
Beliefs & attitudes about FV	Don't understand why got CRC b/c have always eaten plenty fruits and vegetables. Didn't have family history. -Feel like fruits and vegetables are good for you. Not fattening and likes them. -Brought up to eat a lot of fruits and vegetables
Function to F/V Intake	Don't see a connection with fruits and vegetables and values.
Motivator(s) for F/V Intake	Likes to eat them and non-fattening
Barriers to FV intake	Not discussed

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Table XX: Description of Case #8

Case #	8
Sex	Female
Race	African American
Case Status	CRC Non-Affected
Intervention group	Tailored Motivation Interviewing
FV Importance Rating	9/10 Very important Thinks some fruits and vegetables good for mental ability.
FV Confidence Rating	10 Very confident Very confident since many fresh fruits and vegetables available in the summer. Not particular about eating canned fruits and vegetables.
Values and Connection	Family, friendship, mental health Connection Family: Don't have many family (only 2 people in immediate family) so means that friendship would be part of family. Friendship: Did not describe Mental Health: ties in with family and friendship. Need to be mentally alert to be friendly and get along with the family.
FV amounts	Current: 4 servings/day. Sometimes slacks off. Eats different types but not always consistent. Baseline 3.7 servings Follow-up 3.97 servings
Beliefs & attitudes about FV	Knows fruits and vegetables good for you, some fruits have fiber, and some fruits are satisfying like watermelon. They can fill you up so that you won't other foods. 5-9 fruits and vegetables too much would have to include at breakfast, lunch, and dinner. Too much especially during the summer people want to eat less. One way to compensate or to get that many fruits and vegetables is to have things like salads may help to get that much. Knows what serving sizes mean
Function to F/V Intake	Fruits and vegetables keep you mentally alert. And friendship being able to get along with other people if you eat lunch or dinner together and could tie in family also. Eating together with friends and family fits in.
Motivator(s) for F/V Intake	Have more desire for fresh fruits and vegetables during the summer
Barriers to FV intake	Recommended servings too much.

Case #	9
Sex	Female
Race	African American
Case Status	CRC Non-Affected
Intervention group	Combined Intervention
FV Importance Rating	8 Knows not getting as much as she should. But it varies. Days that she does very well and days not so well.
FV Confidence Rating	10 Knows she is able to change shopping habits of buying junk food the kids like.
Values and Connection	God's will Inner strength Humor God's will: I just believe that everything you do should be part of God's will (instrumental) Inner strength: you can't display for me any physical strength or anything unless you have some inner strength...It has to come from within first...(instrumental) Humor: you could...have a calming effect on anything any angle anything anybody displayed towards you by using humor. And I still do it.
FV amounts	Current: Getting about 4 servings daily Baseline 4.3 servings Follow-up 6.19 servings
Beliefs & attitudes about FV	Would have to concentrate on getting the right amounts if she wanted to increase amount. Has problem of using butter and other non healthy seasonings
Function to F/V Intake	Don't want to sound preachy. But Bible says you're supposed to present your body as a living temple and a living sacrifice, so if you're going to take care of it, you got to eat healthy, and eat right, and you know exercise and do the things that right. And you have to have inner peace...because you know you [can't be] depressed angry all the time...has an affect on your physical being... And humor can calm any situation
Motivator(s) for F/V Intake	Did not discuss.
Barriers to FV intake	Grandkids. She buys the kinds of foods they like which is often not fruits and vegetables. And so she eats whatever she gets for them.

Case #	10
Sex	Male
Race	White
Case Status	CRC Survivor
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	9/10 Don't want a recurrence of CRC therefore important.
FV Confidence Rating	8
Values and Connection	Independence, spirituality, friendship Connection with independence & Spirituality Independence: lives independently and would like to do so for as long as possible. Spirituality: "I'm a Clergyman." Volunteers now to serve communion. Friendship: Without family friendship becomes increasingly important. No family in the area. So friends now equals family.
FV amounts	Baseline 5.5 servings Follow-up 5.10 servings
Beliefs & attitudes about FV	Really likes all vegetables especially when fresh, if available.
Function to F/V Intake	Relates to independence and spirituality in wanting to take care of self.
Motivator(s) for F/V Intake	Had self motivation for eating fruits and vegetables As aged liked veggies more Has own kitchen in the retirement home so can keep things he likes to eat available. Recent doctor visit talked about being on a low fat diet so fruits and vegetables much on his mind. His own idea/determination to do so and got guidelines from doctor. Challenge when eat at dining hall of retirement community though management do a fine job of providing balance. Challenge to make good choices from what is being served. Don't want recurrence of CRC. Thinks weighs to much so need to lose weight by changing diet. Needs to see results (weigh loss) for continued confidence in eating more fruits and vegetables
Barriers to FV intake	Lives in retirement community (80 yrs). Though there is a balance of foods, has to eat what they serve. Would prefer more fresh vegetables.

Table XX: Description of Case #11

Case #	11
Sex	Female
Race	African American
Case Status	CRC Survivor
Intervention group	Combined Intervention
FV Importance Rating	10
FV Confidence Rating	10
Values and Connection	Responsibility, strength, inner peace, independence. Connection to fruit and vegetable intake. Responsibility: need to be responsible for self b/c where other people don't care, need to be responsible. You can't depend on people to responsible for you. In order to take care of self, need to be responsible for self. Strength: did not describe Inner Peace: Needs inner peace, and quietness. Need to take time for self. Lives by herself and can do exactly what she wants. For example, playing piano, singing, laying down when want to and that's relaxing. It's peaceful and quiet and that's what needed for inner peace. No one to tell her what to do. Independence: Need independence at all times. Was sick recently. Was sick and wanted to go on. Was upset with friends b/c made her feel like she was incapable of doing things for self.
FV amounts	Current: 4.5 servings/day Baseline 4.3 servings Follow-up 3.31 servings
Beliefs & attitudes about FV	Doesn't eat much fruits and vegetables. The more fruits and vegetables you eat the better digestion system is. More starchy foods difficult to pass. Would do to help digestive system and to get more energy.
Function to F/V Intake	When by self can grab fruit or vegetable to snack on
Motivator(s) for F/V Intake	Doctor has been telling her to eat more fruits and vegetables. Would eat more fruits and vegetables if would fix it differently like putting in a salad rather than eating just plain. Stomach hurts when eat starchy foods rather than fruits and vegetables. Knowing servings size thinks may be able to do better
Barriers to FV intake	Had too much fruit growing up and now that she's grown doesn't like anymore No family to eat with so doesn't include much vegetables. Eats alone so easier to eat other things. Due to illness (bleeding ulcer, cyst, or could be CRC again), sick a lot so doesn't have an appetite Don't take time out to cook vegetables. Thinks canned vegetables not good for you. Thinks it just laziness on her part. Don't like some vegetables. Need to cook differently to remove taste

Case #	12
Sex	Female
Race	White
Case Status	CRC Survivor
Intervention group	Tailored Motivation Interviewing
FV Importance Rating	10
FV Confidence Rating	10 Because I am going to continue to eat. Because I tell you what I ain't got no cancer now.
Values and Connection	Family: Her grandkids very important. Did not know her grandmother very well and other died before she was born. Job: My responsibility to get up and do the best job that I can for the company I work for. She has also been temporarily laid off and is worried that no one will hire her at age 55 & with a history of cancer. Home: wants her home to be neat and orderly not necessarily spotless. Doesn't want someone else to come over and mess up what's hers. Even though her husband says she die and leave it. It is important to her b/c she has to live in it.
FV amounts	Current: Averages about 3.5 servings. Summer months may eat more. Baseline 3.3 servings Follow-up 5.24 servings
Beliefs & attitudes about FV	What you eat has to do with your health.
Function to F/V Intake	Eating more fruits and vegetables sets an example for the grandkids. B/c they are around her so much, what ever she eats, they eat. Grandkids eat fruits and vegetables without realizing how important it is for them. They just know it's good. -If her grandkids get cancer they will have a better chance of fighting it off b/c they've been raised to eat plenty of fruits and vegetables. Even when they eat out the habits she raised them with [eating fruits and vegetables] shows b/c they will fill their plates at the fruit bar. Hopes she hasn't passed her cancer own since it's runs in the family. But if it happens the kids will be prepared in terms of having had a good diet.
Motivator(s) for F/V Intake	I told them if any thing ever happed to one of them youngin's I don't think I would want to live. -Not going to roll over and play dead yet. I had these young in' I have to finish taking care of. Eats well to survive. You will find me eating more fruit and more vegetables then anything else. Because I don't want to get constipated you know. I know how that feels. Evidence of being cancer free (non recurrence) so will continue to eat fruits and vegetables.
Barriers to FV intake	None discussed.

Case #	13
Sex	Male
Race	African American
Case Status	CRC Survivor
Intervention group	Tailored Motivation Interviewing
FV Importance Rating	10 Well, if it proves to be beneficial then you want to do what you feel is the best for you
FV Confidence Rating	7 Because I wouldn't put all my confidence in just the eating fruits and vegetables because I would have to put all my confidence really in God.
Values and Connection	God's will Family Spirituality God's will: I feel that if you follow in God's will a lot of these others [values] would fall in line with it. Family: most important thing I think as far as our earthly walk...Because God has designed the family to be his basic...But, the family's the beginning of everything. And if you let God lead you, then you will have a strong family ties and influence Spirituality is your relationship with God and just let him lead your life.
FV amounts	Current: 2.5 servings Baseline 2.2 servings Follow-up 5.03 servings
Beliefs & attitudes about FV	Have heard some studies about fv preventing cancer Fruit and vegetable recommendations too high. That would be all you eat. My wife does all the planning for me and she's the cook. Normally, I leave up it to her to plan the meals and I tried to maybe eat some fruit in between meals sometimes. Have increased intake a little bit but getting 5-9 will be difficult. Plans to talk to doctor about what kind of fruits he can eat.
Function to F/V Intake	If I eat more fruits and vegetables, then I will be probably influencing my responsibility to lead a healthy life and therefore help my family and perhaps lead a more helpful [life] and just be more beneficial to people in general, if I take care of myself.
Motivator(s) for F/V Intake	Well, if it proves to be beneficial then you want to do what you feel is the best for you [seeing results].
Barriers to FV intake	Look I'm a diabetic, too and so I have to kind of watch how much fruit or what type I eat because of the sugar content. Can't eat a whole lot of fruits without thinking about the consequences. No discussion with doctor about what the right types of fruits he should eat. Rather they just focus on his glucose readings. He is the one who notices what kinds of fruits tend to make his blood sugar go up. I don't think that by doing all the physical things that you can on your own is will be that beneficial. You put God first and that's where you put your confidence in. Wife cooking all the meals and making plans Works 2nd shift so don't have a variety for that meal. Usually a sandwich.

Case #	14
Sex	Male
Race	White
Case Status	CRC Survivor
Intervention group	Combined Intervention
FV Importance Rating	8 Conscious of it and trying to make a habit. There is still a lot of fruits and vegetables that I still don't eat. Haven't changed lifestyle to point where eating things that haven't eaten before. Now just conscious of what it is now. Haven't added just eating more of the same fruits and vegetables.
FV Confidence Rating	7 Thinks about fruits and vegetables especially during hot weather. Make conscious effort to pick up water instead of soda when ready to snack.
Values and Connection	Health, independence, growth Thinks that the values he chooses will be biased because of CRC and stroke. Health: had started exercise before colon surgery but continued that after. Growth: Since stroke and colon surgery had to keep changing and adjusting. Has had a different way of life. Independence: because had to go through therapy to recover use of right side. Haven't recovered normal bowel functioning.
FV amounts	Baseline 2.3 servings Follow-up 3.60 servings
Beliefs & attitudes about FV	Wanted to learn about fruits and vegetables because feel like could benefit more Wasn't concerned about fruits and vegetables until diagnosis of CRC Makes a conscious effort to add, keep track of fruits and vegetables. Since is at home allows for more control in the amount taken in Never thought about how easy it is to pick up an apple instead of a bag of potato chips. Only until after illnesses.
Function to F/V Intake	Grandchild was born also in that time period. Realized normal real world stuff less important rather keeping up with family and grandkids more important.
Motivator(s) for F/V Intake	Being at home (not working) able to think about fruits and vegetables more and plan, and keep track of what eating Being diagnosed with CRC Grandchild was born also in that time period. Realized normal real world stuff less important rather keeping up with family and grandkids more important. Available in house. Wife has always had fruits and vegetables available. Internet offers variety of reading on health.
Barriers to FV intake	personal taste preference

Case #	15
Sex	Female
Race	African American
Case Status	CRC Survivor
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	10 Thinks important to eat at the recommended levels
FV Confidence Rating	10 Knows will try to eat more servings of fruits and vegetables.
Values and Connection	God's will, health, strength. Connection with eating. God's will: trusting him and having faith in him Health: try to stay healthy as long as you can Strength: the Lord gives strength by having faith in him and trusting in him.
FV amounts	Current: 3.5 servings/day. Eating more fruit not vegetables Baseline 3.6 servings Follow-up 5.89 servings
Beliefs & attitudes about FV	Loves fruit but didn't eat as much as she does now. Used to drink alcohol so didn't eat too much fruit. Knows fruit has a lot of fiber which helps her a lot. Thinks fruit and vegetable recommendation good. Eating 5 per day is doable.
Function to F/V Intake	Thinks connection to health and doing God's will but did not describe
Motivator(s) for F/V Intake	Stopped drinking alcohol so now takes the time to eat healthy like fruits and veggies. Joined the church so stopped drinking and able to pursue healthier behaviors. Stopped drinking on her own. Just weaned herself off of drinking and folks who she drank with. Didn't think it was hard to do. CRC diagnoses helped her to change the way she eats to adding more fruits and grains. CRC made her nervous b/c doctor said she had CRC for a couple of yrs [late stage diagnosis?] Thinks just has to do it [to eat at recommended level] Would have to buy more at store especially when on sale. To keep strength and to be healthy need to continue to keep faith in God
Barriers to FV intake	Did not discuss

Case #	16
Sex	Male
Race	White
Case Status	CRC Non-Affected
Intervention group	Combined Intervention
FV Importance Rating	8 Likes to eat. If can increase importance of eating more vegetables will reduce amount of sugar
FV Confidence Rating	10 If put in front of him, he will do it
Values and Connection	Health, strength, independence. Connection with eating fruits and vegetables. Health: Plan is to live until 92. Now 60yrs so need to be healthy to get to live that long Strength: did not discuss Independence: No value to living long if don't have independence and strength. Has a lot of hobbies and haven't delved into all yet-deeply enough
FV amounts	Current: 5 or 6 FV servings/day. But now (summer) believes he eats more. Baseline 5.9 servings Follow-up 8.01 servings
Beliefs & attitudes about FV	Loves to eat all types of food Eating properly is the key…at least two-thirds of the key to being healthy is eating properly. I'm not doing it yet and eating fruits and vegetables and eating less meat and balancing out with the right kind of carbohydrates is how you do it. For me. With a little bit of exercise.
Function to F/V Intake	Connection. Fruits and vegetables is a key ingredient to being healthy. Eating less meat, more fruits and vegetables, and exercise part of being healthy. Having good health is important to being independent and having strength.
Motivator(s) for F/V Intake	Describes self as morbidly overweight and knows weight will kill him. So trying to eat more fruits and vegetables to help with weight loss. Also on meridian drugs, and does walking. Has dropped 40 lbs. Was concerned about diet but hadn't made up mind to work on it. Then changed his mindset by slowing working up to it (eating better and getting exercise).
Barriers to FV intake	Will eat anything put in front of him. Loves sweets and haven't been able to cut down sweets. Relatives visiting will not always eat healthy. Need to find out what is in his head that is screwing him up in making changes. Have tried many things like drugs and mental strength but have seemed to be able to conquer weight problem

Case #	17
Sex	Female
Race	White
Case Status	CRC Non-Affected
Intervention group	Combined Intervention
FV Importance Rating	10 Just knows that it's really important.
FV Confidence Rating	6 When talking with the interviewer feels confident but doesn't know once she gets off the phone.
Values and Connection	Spirituality, God's will, and health. Connection to eating fruits and vegetables. God's will: wants his will to be done in her life Spirituality: wants to grow more spiritual Health: wants to work on health by eating better and eating less, and exercising more
FV amounts	Current: about 3 servings (more vegetables) Baseline 3.6 servings Follow-up 5.66 servings
Beliefs & attitudes about FV	Knows should eat more vegetables, eating less meat; decided eating too much meat Laughed at amount recommended but later says thinks it's a great recommendation Knows have to do much better even though is eating about 3-4 servings daily. Just need to make herself to eat more fruit b/c doesn't care much for fruit. In past have not eaten much fruit. Has to make up her mind. Thinks get enough veggies. It's a mind thing. You have to make up your mind about doing things like this before doing it-goes for almost anything.
Function to F/V Intake	Connection there because knows when taking care of body you're pleasing God. Our bodies are the temple of the Holy Spirit and is sure He is pleased when we take care of it.
Motivator(s) for F/V Intake	Have to make up her mind Have to try to choose to buy more fruit. In her mind that she doesn't really want it. Feels like she is getting more now that she realizes the serving size and that fruit juices count. Call an encouragement, makes her think more about eating more fruit.
Barriers to FV intake	Dislike of most fruits. Likes only cantaloupes.

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Case #	18
Sex	Male
Race	White
Case Status	CRC Non-Affected
Intervention group	Combined Intervention
FV Importance Rating	8-9 Knows important but eat more fruit. Because don't like some vegetables.
FV Confidence Rating	10 Have been eating fruits all his life and nothing will change that.
Values and Connection	Family, friendship, health. Connection to eating. Family: Has come across people who don't have any family. Thinks of them as lost souls because don't have people they can relate to b/c of the family ties. You can take the boy out of the country but you can't take the country out of the boy. Is Scottish but about to be an American citizen but stay in contact with family. Would have to make a conscious decision to change accent. Born in Scotland but happen to live in America but still Scottish through and through. In contact with family overseas almost on a daily basis. With family you get a cast of characters. Family can be funny and you always get a good laugh. Life can be hard in Scotland, economy is in a bad state but you go to a pub and everyone is laughing. They have a good sense of humor and big talkers, can talk you into the ground. No hidden agenda, don't make things up, tell you what you mean. Whereas with people in US especially in business people will say what you want to hear and its hard to trust. Faith and trust important in relationships. Friendship: rides with a friend. Can ride and talk. Biking helps relieves stress. Great way to stay in shape. Health: did not describe.
FV amounts	Current: 4 servings/day, mostly fruit but tries to get vegetables Baseline 3.7 servings Follow-up 8.13 servings
Beliefs & attitudes about FV	Growing up in Scotland used to having a piece of bread or fruit for a treat. Not used to having McDonald's. When lived overseas was used to eating lots of fruits because they fill you up.
Function to F/V Intake	Some people will stress money and wealth but the most important thing is your health. Don't matter how much money you've got and don't have health, you can't enjoy what you've got. If you don't see health as important and put other things in place, you will pay the price at some point. Important to take care of self b/c don't like other people doing things for him. His bike is his health insurance.
Motivator(s) for F/V Intake	Fruits are easy. Cyclist so bananas are the perfect fruit. Easy to carry and put in back pocket when riding and has lot of nutrients that you need.
Barriers to FV intake	Scottish so some cultural barriers like won't eat okra now that he lives in the south.

Case #	19
Sex	Male
Race	White
Case Status	CRC Non-Affected
Intervention group	Combined Intervention
FV Importance Rating	Very important-9 But must have room for error because sometimes you slip a little bit.
FV Confidence Rating	9 Very confident
Values and Connection	Justice, independence. God's will. Connection with independence Justice: doesn't feel like the promotion of fair and equal treatment is going on in the world Independence: to meet your own needs. This is up to the individual. He has always done that. God's will: try to do this
FV amounts	Current; 5 servings daily Baseline 5.7 servings Follow-up 8.69 servings
Beliefs & attitudes about FV	Likes fruits and vegetables
Function to F/V Intake	Connected to independence Try to keep up your house, your appearance especially being 80yrs old even though sometimes it is hard to get around.
Motivator(s) for F/V Intake	Summer time allows to get lots of fruits and vegetables but doesn't think winter is a hindrance Likes fruits and vegetables Wife tries to fix a balanced diet. Married 55yrs. Have a lot of help Grows own vegetables
Barriers to FV intake	Did not discuss.

Case #	20
Sex	Male
Race	White
Case Status	CRC Survivor
Intervention group	Combined Intervention
FV Importance Rating	10
FV Confidence Rating	10
Values and Connection	Responsibility, inner peace, hope, independence, God's will, loving, family, spirituality, forgiveness. Connection to eating. Responsibility: don't have children. So need to stay in shape to take care of self. Hope: did not discuss Independence: did not discuss God's will: did not discuss
FV amounts	Current: 5 servings/day. Still gets this amount Baseline 9.5 servings Follow-up 9.98 servings
Beliefs & attitudes about FV	Made up mind to eat fruits and vegetables For other people who are having difficulty making changes, his advise is that you just have to do it, have to make up your mind. Quit many times before succeeding but when you're ready, you're ready. If you don't help yourself no one will help you. To get better you have to do it yourself no one can do it for you.
Function to F/V Intake	If feel good and taking care of self and reached goals will feel good about everything. All these values will fall into line. All part of one's mental attitude
Motivator(s) for F/V Intake	Is "bull-headed" and just "made up my mind" to do it [eat fruits and vegetables] had gallbladder problems, then bleeding, then CRC, and weight gain so decided needed to make up mind to make changes like eating fruits and vegetables. Couldn't walk up stairs without losing breath so had to make up mind that something must change. Now BP normal, cholesterol down, weight loss. Rewards of buying smaller size clothing, feeling better, more energy, feeling better than when was 35yrs. Had a good surgeon that support him in making changes, and was realistic about what steps to take (keeping records, weight self once a week, eat less if putting on weight, reward self with maybe a dessert if see progress, be consistent) Don't mind going to doctor now b/c don't get lecture about weight.
Barriers to FV intake	Those changes of eating better not difficult, challenge at dinner table to eat less and leave a little less full. So had to keep mind on something else.

Case #	21
Sex	Female
Race	African American
Case Status	CRC Non-affected
Intervention group	Combined Intervention
FV Importance Rating	10 Really important for your health.
FV Confidence Rating	10 Confident
Values and Connection	God's will, loving, family. Connection to eating. God's will: Loves the Lord, doing His will, going to church, serving him. Attends church every Sunday. Love: need to be loving with family. Loves people, hugging, smiling and people. Can't frown if you want love. Don't have an attitude b/c not welcoming to others and no one will care for you. Have to realize how fortunate you are, can't judge those who are less fortunate b/c don't know their situation, if family caring etc, you just have to love people for who they are. Family: need to have a good relationship with family
FV amounts	Baseline 5.9 servings Follow-up 9.06 servings
Beliefs & attitudes about FV	Has been working on getting more fruits and vegetables in diet Cut back on sodas and if drink then diet, every day have a salad with fruit. Started making changes about 2 weeks ago. Knows good for bowel movement so have been eating more. Behavior can set a good example for others.
Function to F/V Intake	Connection of values with eating but did not elaborate.
Motivator(s) for F/V Intake	Went to doctor and high blood pressure fine. Combination of fruits and vegetables and blood pressure medicine may have helped to decrease blood pressure. Keeps fruits and vegetables around all the time. Just made up mind to eat more and started doing it and it was easy. Works around food so easy to get some there. Strong willpower
Barriers to FV intake	Used to take care of mom for 3yrs. Would cook late and feed her and stay at home with her. So was easy to eat poorly.

Case #	22
Sex	Female
Race	White
Case Status	CRC Non-affected
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	9 Mentally don't feel healthy.
FV Confidence Rating	6/7 Comes down to forcing self to do it. Make self slow down. But likes to be involved in different things
Values and Connection	Inner peace, family, growth. Connection to inner peace Inner peace: a fairly private person so needs to be at peace with self before anyone else at peace with her. Family: Do think one can be really happy unless have a loving family for support and sharing. Growth: Very inquisitive and likes to keep learning different things. For example, about to start line dancing and signed up for classes to be a flower show judge. Likes to learn different things. Don't like people that become stagnant and staying at home. Don't like being in a rut. But this can cause family problems b/c seen as branching off here and there, somewhat unpredictable in some of the things she goes after. Thinks everyone needs to continue to grow until the day they die.
FV amounts	Current: 6 servings FV daily 6 month ago when survey administered. But has reduced to 1-2 servings. Baseline 5.9 servings Follow-up 6.88 servings
Beliefs & attitudes about FV	Eating goes in spurts. Don't like that she has not been eating fruits and vegetables as she should. Had lots of strenuous stuff going on. Hopes things will calm down to eat better. Don't eat enough to keep metabolism up. Eating well allows her to be physically fit, mentally strong.
Function to F/V Intake	Relates to inner peace b/c eating fruits and vegetables makes her feel good about self. If knows she's eating well then feel good mentally, physically, and knows she's doing the right thing.
Motivator(s) for F/V Intake	Needs to have more discipline to make self eat, for example, a bowl of cereal before leaving in the am to counteract busy lifestyle. Needs a routine. Get breakfast first then start the day. When at home it's easier to think about eating b/c come in and out of kitchen in winter months. In summer time when out in garden, don't want to come in so skip eating. If got a serious illness then would be motivated to eat better. Would be more disciplined.
Barriers to FV intake	Not eating 3 meals consistently so get less fruits and vegetables. When get too busy it's hard to eat well. Forgets to eat b/c so busy. Puts eating on the back burner in these instances. Easy to skip breakfast and eat about mid afternoon. Yet needs to lose weight. Mentally knows what needs to do but problem with making self do it. Would have to give up some things doing to be less busy to be able to eat better. Car eater. Eats drive thru meals and knows can't get healthy that way b/c no healthy foods at drive thru. Doesn't like to eat alone so won't take time to eat at a restaurant.

Case #	23
Sex	Female
Race	White
Case Status	CRC Non-affected
Intervention group	Combined Intervention
FV Importance Rating	10 Very, very important. Diet plays important part especially as you get older.
FV Confidence Rating	9 Following what doctor says to do.
Values and Connection	Spirituality, health, family. Connection to diet. Spirituality: inner peace part of it, growing in faithfulness to God, almost always have a class of some kind going, church is important Health: has become more aware. See many people her age and younger who are not health gives her an opportunity to keep doing things to help other people and to enjoy life. Family: a closeness with children and grandkids. Husband still alive and still enjoy each other. Has been married for 60 yrs.
FV amounts	Current: Eats about 10 servings daily. Have been eating like this for more than 5 yrs; was concerned about getting more fruit some yrs ago so added more. Baseline 10.6 servings Follow-up 7.75 servings
Beliefs & attitudes about FV	Bowels not regular if don't get enough fruits and vegetables Thinks serving recommendation is great. Surprised that grandkids how little fruit they eat. So trying to influence them also.
Function to F/V Intake	Eating better promotes better health b/c better health gives more time to be with her family
Motivator(s) for F/V Intake	Getting older. Getting smarter about health as age. When see other people not as healthy, it is an opportunity to help others and so don't take own health for granted. Follows what doctor says to do. He gives her a good report. Since feeling so well will keep on. Husband's heart surgery 5 yrs ago has encouraged her to eat better. Health promotion info from doctor, study, and magazines reminder
Barriers to FV intake	-Doesn't see being totally confident to eat more fruits and vegetables b/c she is 79 and don't want to be over confident that she can push it up much higher.

Case #	24
Sex	Male
Race	African American
Case Status	CRC Non-affected
Intervention group	Tailored Motivational Interviewing
FV Importance Rating	10 Not lower b/c 6 or 7 means you're trying but not succeeding. 10 means you put forth more effort and willing to do what is necessary.
FV Confidence Rating	10
Values and Connection	Responsibility, physical and mental health, spirituality. Connection to eating healthy. Responsibility: being responsible for self and taking on things that will benefit self and eventually benefit others. If can't help self then can't help other people. Physical and mental health: If don't' have this and the responsibility to take care of it then it doesn't matter. It is all for nought. Goes back to being responsible and taking care of mental and physical health. If have responsibility you're not going to go out and do things that jeopardize your health, like alcohol and drugs. We as a society has failed to teach our children responsibility. B/c responsible people are not on drugs or obese. Not being conceited b/c obese people are that way b/c of how eat. And are reminded of their weight when get into shower every day. If responsible will go do something about it. Spirituality: very much involved in religion but not to the point it will take precedence and jeopardize life and future. Not like people who refuse blood transfusions and other life saving methods. That's what doctors are for. You have to have basic common sense when dealing with spirituality. Can't let religion over shadow common sense, you've lost it all.
FV amounts	Baseline 4 servings Follow-up 8.05 servings
Beliefs & attitudes about FV	You can't always eat healthy but need to do so as often as you can so don't jeopardize health.
Function to F/V Intake	Connection. Studies that he's read and have seen older folks who maintained lifestyles primarily because of their good diets. You are what you eat. If don't eat well jeopardize your health and that becomes part of mental well-being. Eating healthy is a part of being healthy.
Motivator(s) for F/V Intake	As get older start taking stock of life. At class reunions look at health problems that people have and is able to compare to himself. Compared to them realizes he is much healthier and don't have health problems. Thinks it's because of education and responsibility. You are responsible for self. Part of growing older is growing wiser. You should be able to make better health decisions. If healthy there are some diseases that you are likely to avoid. Father died of heart problems and mom has diabetes. Thinks this happened b/c back then they didn't know all that soul food will kill you. Have never seen anyone who has lived to be 100 that is obese. Wants to live longer so need to healthy. Changed eating habits b/c had problems with BP, stomach, and cholesterol. Over 20yrs doctor said he had to eat better, exercise, cut out alcohol and smoking. Saw improvements within 6mths of doctor's advice. Financially not a problem to eat healthy. Has more energy, clear thinking, feels good. Very seldom has a bad day. Have to have it in your head that it's what you want to do. You have to have controls in life that will steer in the direction of doing it. If you're the type of person that doesn't have controls, and not willing to make change then not a sacrifice. Change is something that you decide to do and want to do it. Have to do what want to do. You have free will. It's all in your head. Driving force is seeing older people (mother-in-law and old lady up the street) and conditions they're in is not appealing. These people are not independent, have to have others take them to the bathroom, drive them around etc. All of us will get old but don't need to get old with the dementia and inabilities that's a problem. And this comes back down to responsibility. Some of the people are in the same economic bracket, live in the same neighborhood with access to the same resources like grocery stores. So there's no excuse except that it is in your mind. You decide if you want to be wheeled around in a wheelchair or to walk independently your own.
Barriers to FV intake	Wife doesn't eat as strictly as he does. But feel like you have to live for self and make own decisions.

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