

**Religion and Spirituality as a
Coping Mechanism with Cancer**

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Zusammenfassung

Das Ziel dieser Dissertation ist es, den Zusammenhang zwischen Religion und Spiritualität auf der einen Seite, und der Bewältigung bzw. Umgang mit einer Krankheit auf der anderen Seite besser zu verstehen. Im Spezifischen untersucht diese Arbeit Religion und Spiritualität als Bewältigungsmechanismen für eine Krebserkrankung. Dies ist insbesondere für Krebspatienten wichtig, da die Wissenschaft Religion und Spiritualität als Bewältigungsmechanismen erforscht hat und die bisherigen Ergebnisse kontrovers sind. Das vorrangige Ziel dieser Analyse ist es daher, zu verstehen ob Religion und Spiritualität positive Bewältigungsmechanismen für Krebspatienten sind, und wie dieser Zusammenhang von Patienteneigenschaften (z.B. Alter, Bildung) oder Krankheitsvariablen (z.B. Krebsart, Stadium) abhängt. Die Methodik dieser Arbeit ist eine systematische Meta-Analyse sämtlicher vorhandenen empirischen Studien. Vier wesentliche Ergebnisse ergeben sich aus dieser Studie. Erstens korreliert Spiritualität bzw. dessen 'Sinn'-Komponente signifikant positiv mit Lebensqualität und negativ mit emotionalem Stress. Zweitens ist die Korrelation der 'Sinn'-Komponente von Spiritualität mit Lebensqualität und Emotionalem Stress stärker als dessen 'Glauben'-Komponente.

Drittens weist generelle Religiosität nur einen schwach bis nicht signifikanten Zusammenhang mit Lebensqualität und emotionalem Stress auf. Viertens zeigt religiöse Bewältigung (hauptsächlich negative religiöse Bewältigung) eine signifikant positive Korrelation mit emotionalem Stress und eine signifikant negative Korrelation mit Lebensqualität, während positive religiöse Bewältigung keinen signifikanten Zusammenhang mit den abhängigen Variablen zeigt. Diese Ergebnisse zeigen, dass Spiritualität als positiver Bewältigungsmechanismus für Krebs angesehen werden kann, insbesondere wenn Patienten in der Krankheitssituation eine Bedeutung finden können. Für soziodemografische sowie

Krankheits-Charakteristika konnten nur ein teilweise signifikanter, jedoch nicht konsistenter moderierender Einfluss auf die verschiedenen Zusammenhänge zwischen unabhängigen und abhängigen Variablen gefunden werden. Der moderierende Einfluss solcher Variablen sollte daher in Zukunft in direkten empirischen Versuchen und Studien detailliert untersucht werden.

Stichwörter: Religion, Spiritualität, Krebs, Lebensqualität, emotionaler Stress.

Abstract

The aim of the present study is to investigate the existing controversially debated relationship between religion and spirituality and coping with an illness. Specifically, the study analyzes religion and spirituality as coping mechanisms with cancer, since for cancer patients in particular little is known about religion and spirituality as a coping mechanism, in addition to the very diverse results published so far in the field. The study's goal is to understand whether religion or spirituality can be viewed as a positive coping mechanism for cancer patients and whether this relationship depends on a patient's specific characteristics (e.g. age, education) or on the illness characteristics (e.g. cancer type, illness stage). The applied research methodology is a systematic meta-analysis, a research method that was evaluated as the most appropriate to ensure that the current research problem is clearly defined and set within the established context. Four main findings emerged from this research. First, spirituality highly correlates with augmented quality of life and with reduced emotional distress. Second, the meaning component of spirituality showed stronger correlations with higher quality of life and reduced emotional distress in comparison to the faith one. Third, general religiousness showed weak to non significant correlations with quality of life and emotional distress. Fourth, negative religious coping showed significant relations with augmented emotional distress and reduced quality of life while positive religious coping showed non-significant relationship with the mentioned above dependent variables. The results suggest that spirituality as a coping mechanism with cancer is a strong positive coping mechanism. Specifically, constructing a meaning from the illness experience seems to have a powerful connection with a better psycho-social well being among cancer patients. At the same time, religion has both positive and negative implication for psycho-social well-being of cancer patients, depending upon the type of religion as mentioned above. Last, illness and socio-

demographic variables did not show a consistent pattern of moderation for the effect sizes of the different dependent-independent variables combination, suggesting that when it comes to religion and spirituality, situational factors and specific religious and non religious functions, beliefs and practices need to be taken into account.

Key words: religion, spirituality, cancer, quality of life, emotional distress.

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1. Introduction

1.1. Overview

Cancer is a serious health problem and one of the major diseases causing death today (Lin & Bauer-Wu, 2003). In Europe only it is estimated that there are 3.2 million new cases of cancer and 1.7 million deaths from cancer every year (Ferlay et al., 2007). Such a disease imposes various challenges that can be extremely powerful, especially since it is a life threatening one.

When facing a disease such as cancer, patients have to cope with several changes in different areas of their lives (Knight & Emanuel, 2007). Although it may seem that cancer is an aversive life event that can lead only to suffer and negative feelings, it has in fact a different meaning for every human being. Therefore cancer disease can lead different patients to using a different array of coping mechanisms that are unique to the person's characteristics and the individual situation (Lazarus & Folkman, 1984).

Religion and spirituality are two of those specific coping mechanisms, lately becoming a main focus of interest in the research field (Stefanek, McDonald & Hess, 2005). Over the past decade the link between religion / spirituality and coping in general (Pargament, 1997) and between religion / spirituality and coping with an illness in particular (e.g. cancer) has aroused a lot of interest not only within the scientific field but also among clinicians dealing with patients' religious and spiritual needs (Ziegler, 1998). Several researchers have suggested that there is a very strong connection between religion / spirituality and health although complex and controversial (Powell, Shahabi & Thoresen, 2003; Zwingmann, Wirt, Muller, Korber & Murken, 2006; Thoresen & Harris, 2002).

Due to the debated religion / spirituality–health connections, advancing the understanding of whether religion and spirituality can be viewed as positive coping mechanisms for cancer patients' adjustment to the disease and under which conditions seems to be important for two main reasons. First, the emerging conclusions and recommendations may enrich the clinical research on the religion–medicine interface which at the moment is still scarce (Lukoff et al. 1999 as cited in Chibnall & Brooks, 2001). Second, it will help physicians to address religious issues with their patients that seem to be resistant toward discussing ordinarily religious and spiritual topics with their patients (Maugans & Wadland, 1991).

This dissertation seeks therefore to draw conclusions regarding the role of religion and spirituality in health among cancer patients, specifically in respect to patient's well being, quality of life and emotional distress. The dissertation opens with the introduction part, in which an overview of the cancer disease and its influence on cancer patients' lives will be given. The introduction continues with an explanation of the term 'coping' and its relation to illness, following by an explanation of the terms 'religion' and 'spirituality' also providing an overview of their connections to health and coping among cancer patients. The introduction ends with the description of the purpose of the present study and of the present research questions. Next to be presented, will be the methodology part of the dissertation, in which the research methodology will be explained in details followed by the results part and ended with the discussion part and the main conclusions derived from it.

1.2. Cancer–background

1.2.1. Cancer–definition

Cancer is a term used for diseases in which abnormal cells divide without control and are able to invade other tissues through blood and lymph nodes. Cancer is not just one disease but a group of diseases constituted of more than 100 different types of cancer. Cancer types can be grouped into five broad categories:

Carcinoma: Cancer that begins in the skin or in tissues that line or cover internal organs.

Sarcoma: Cancer that begins in bone, cartilage, fat, muscle, blood vessels or other connective or supportive tissue.

Lymphoma and myeloma: Cancers that begins in the cells of the immune system.

Leukemia: Cancer that starts in blood-forming tissue such as the bone marrow and causes large numbers of abnormal blood cells to be produced and enter the blood.

Central nervous system cancer: Cancer that begins in the tissues of the brain and spinal cord.

In addition to the type of cancer, it is important to also note the stage of cancer.

Cancer's stage in the body is a parameter based on the size of the tumor, on whether lymph nodes contain cancer cells and whether the cancer has spread from the original site to other parts of the body. Once those parameters are measured, a stage of I, II, III or IV is assigned, with stage I being early and stage IV being advanced disease (www.cancer.gov).

1.2.2. Cancer–etiology

The causes for cancer disease are not yet completely known. Research shows that there are specific risk factors that are connected to cancer's development. Among those risk factors growing older, tobacco consumption, sunlight, ionizing radiation, certain chemicals

and other substances, some viruses and bacteria, certain hormones, family history of cancer, alcohol consumption, poor diet and lack of physical activity are most common risk factors. Over time several risk factors may act together to cause normal cells to become cancerous (www.cancer.gov).

1.2.3. Cancer–treatment methods

Treatment methods depend mainly on the type of cancer and the stage of the disease. The patient's age and general physical condition are taken into account once deciding on the appropriate treatment. The goal of the treatment is often to cure the cancer but also to control the disease and reduce its' symptoms for as long as possible. Treatment can also change in the course of time according to the development of the disease. Most treatment plans include: surgery, radiation therapy or chemotherapy. Some treatments involve hormone therapy or biological therapy. In addition, stem cell transplantation may be used so that the patient can receive high doses of chemotherapy or radiotherapy (www.cancer.gov).

1.2.4. Cancer–distribution around the world (USA and Europe)

According to the latest statistics, cancer causes around 7.6 million deaths worldwide each year. Of these, more than 72% occur in low- and middle-income countries (www.iarc.fr)

Division around the world:

European Union: Every year 3.2 million Europeans are diagnosed with cancer, which is also the second most common cause of death in Europe (29% of deaths for men, 23% for women)—a figure that is expected to rise due to the aging European population. In fact, it has been predicted that one in three men and one in four women will have been directly affected by cancer by the time they are 75 years old. The most frequently occurring forms of the disease in Europe are breast, colorectal and lung cancers. Although significant progress is

being made in the fight against the disease, cancer remains a key public health concern and a tremendous burden on European societies. Europe is currently characterized by worrying inequalities in cancer control and care, existing within, as well as between, EU Member States. Of the 53 countries in the WHO European Region, Hungary has the highest cancer mortality rate (458 per 100 000 population), followed by the Russian Federation and Ukraine (347 per 100 000). This has been suggested to be the result of high smoking rates. Breast cancer is responsible for the most cancer-related deaths among women (17.2%), while lung cancer is a leading killer among men (26.9% of the total) in the European Region. Lung cancer mortality rates are highest in Hungary (135 per 100 000 population), followed by Poland (93 per 100 000) and Croatia (86 per 100 000). Romania leads the statistics in cervical cancer deaths (21 per 100 000 population) while breast cancer deaths are highest in Belgium and Armenia (37 per 100 000) (www.euro.who.int; <http://ec.europa.eu>).

USA: A total of 1,529,560 new cancer cases and 569,490 deaths from cancer are estimated to occur in the United States in 2011. Cancer is the second most common cause of death in the USA, exceeded only by heart disease. In the USA cancer accounts for nearly one of every fourth death, showing disparities in the cancer burden among different segments of the USA population defined in terms of socio-economic status (income, education, insurance status etc.), race/ethnicity and gender. Persons with lower socio-economical status are having disproportionally higher rates of cancer and mortality following a cancer diagnosis (35% higher likelihood). Among the different ethnical groups, African-Americans are more likely to develop and die from cancer (32% higher likelihood). Geographic area is another variable influencing the variability in cancer rates within the USA. Nevertheless, overall cancer incidence rates decreased in the most recent time period in both men (1.3% per year from 2000 to 2006) and women (0.5% per year from 1998 to 2006), largely due to decreases in the 3 major cancer sites in men (lung, prostate, and colon / rectum [colorectum]) and two major

cancer sites in women (breast and colorectum) (Jemal, Siegel, Xu & Ward, 2010; www.cancer.org).

1.3. Common challenges imposed by the disease

Despite the very many existing treatments, cancer is, as stated, still one of the main causes for death (Lin & Bauer-Wu, 2003). The numerous challenges imposed by the disease can be broadly divided into three main domains: the physical, the psycho-social and the philosophical-existential domain (Knight & Emanuel, 2007). Each of the dimensions mentioned above receives a different weight and expression by cancer patients according to the patient's coping style and interpretation of the situation and according to his physical and psychological subjective suffering (Block, 2001).

1.3.1. The physical dimension

The physical dimension includes a process of recognition of the growing physical limitations as a consequence of the progression of the disease and its' treatments. Every type of cancer imposes a specific and unique array of challenges (Block, 2006). The patient has to face his weak and vulnerable situation, his loss of independence and control over basic movements and needs, forcing the patient therefore to get used to a new situation in which activities that are trivial for a healthy person become an everyday challenge (Chochinov, Hack, Mclement, Kristjanson & Harlos, 2002). The physical symptoms associated with cancer are various and diverse, from pain symptoms to non-pain symptoms such as weakness, fatigue, lack of appetite, nausea, constipation, diarrhea, dry mouth and more (Van den Beuken – van Everdingen et al., 2009). Those physical symptoms are unpredictable and changeable, leading to an augmentation of the patient's suffering (Rydahl-Hansen, 2005). Patients' suffering following the physical restrictions imposed by the disease seem to influence men more than women, since men perceive physical limitations as highly distressing while women

are more concerned about the psychological ones (Herschbach et al., 2008). Those physical symptoms create a feeling of vulnerability, cessation and damage to the patient's sense of body integrity and sexual image. Those patients feel ashamed and unattractive, leading sometimes to difficulties in creating or maintaining an intimate and sexual relationship (Dunn et al., 2006). The potential side effects of the various treatments such as loss of hair, nausea and more, add to the patients' feelings of shame and guilt, especially toward the intimate partner. Depression and anxiety can add to the sexual dysfunctions experienced by the cancer patient (Rowland, 1989 as cited in Holland & Rowland, 1989).

1.3.2. The psycho-social dimension

Sadness, fear, loneliness and despair are feelings experienced by every person dealing with a potentially terminal illness (Block, 2006). Those feelings arise as part of the person's experience in dealing with present and future losses that are accumulative, deep and sometimes even irreversible, leading in part of the cases to the loss of existence itself (Knight & Emanuel, 2007). Many patients feel a sense of helplessness and loss of control once facing the inability to predict the course of the disease and the influence of its' treatment while constantly knowing about the possibility that they might eventually die. The deterioration of their physical status augments even more the patient's sense of loss of control and fear of the progression of the disease (Rydahl-Hansen, 2005). Fear of progression of the disease affects patients' physical and mental quality of life, influencing also cancer related intrusive thoughts that in turn dictate the reality of living with cancer (Mehnert, Berg, Henrich & Herschbach, 2009). This fear of progression of disease is augmented for patients with a longer duration of disease and with a clear illness behavior such as frequent doctor visits (Herschbach et al., 2005). Dependency on other people or on technical devices adds to the patient's feeling of guilt and shame, since the patient might fear being a permanent burden on the significant other (Rowland, 1989 as cited in Holland & Rowland, 1989). Those feelings of loss of control

in the present might lead to the feeling of hopelessness also regarding the future among those patients (Benzein, Norberg & Saveman, 2001). Fear might develop not only because of the threat of death itself but also because of the inability to predict the way in which this death might be happening eventually (Chochinov et al., 2002). Anxiety and depression become very common problems among cancer patients (Brown, Kroenke, Theobald, Wu & Tu, 2010), being influenced also by the medical context (the development of the disease, the treatment type offered, presence of pain etc.), the psychological background of the patient (history of previous losses in life, ability to adapt and cope etc.) as well as by the socio-economical background (presence/absence of social support, financial stability etc.) (Miller & Massie, 2006). Mitchell et al. (2011) conducted a meta-analysis regarding the prevalence of depression, anxiety and adjustment disorders among cancer patients in oncological, hematological and palliative care settings. Founding suggested that there are no differences in the prevalence of depression, anxiety and adjustment disorders between palliative and non-palliative settings. The prevalence of major depression among cancer patients ranged between 16.3% to 16.5% for major depression, 15.4% to 19.4% for adjustment disorder and 9.8% to 10.3% for anxiety disorders. No association was found between mean age or gender and the prevalence of anxiety or depression among cancer patients. Results suggest that mood complications associated with cancer should be considered once dealing with cancer patient's psycho-social concerns. Among the various existing sources of psychological distress for cancer patients fear of progression of disease, fear of not being able to follow one's previous activities and fear of being hospitalized again are most influential on cancer patients' psychological distress. Highest rates of psychological distress were observed among patients with breast cancer and with soft tissue cancer (Herschbach et al., 2004). A potentially terminal illness such as cancer creates also very many changes in the persons' interpersonal relationships and roles. Cancer can create tension in relationships on the one hand but also a

deep sense of appreciation and connection with a significant other, on the other hand (Block, 2006). Yet, those feelings are diluted with feelings of shame from being dependent on and deserted by the significant other. The patient might fear becoming insignificant for the other, especially following his inability to fulfill previous roles the way he used to before the outburst of the disease (Rydahl-Hansen, 2005; Rowland 1989 as cited in Holland & Rowland, 1989; Block 2001; Morita, Tsunoda, Inoue & Chihara, 2000; Blinderman & Cherny, 2005). Additionally, the cancer patient has to face his very many worries about the relatives that he might leave behind (Yeung, French & Leung, 1999), legal and logistical worries (Houts, Yasko, Kahn, Sceltzel & Marconi, 1986) and financial ones (Miller & Walsh, 1991; Covinsky et al., 1994). The patient has to deal also with his relationship with his physician and the medical system in general. Patient-doctor relationship is the frame in which the illness experience of the patient and his family takes place. That is so, since the doctor is the one responsible to give the patient and his family the information regarding the patient's condition, to show competence and commitment and to be the one that predicts the problems in advance in order to solve them. The doctor is the one that also has to show a caring attitude toward the patient, treating him as a whole individual, thus providing the patient and his family with the optimal conditions to deal with the disease (Block, 2006; Molen, 2000). However, very many patients have difficulties in receiving information, guidance and support from the medical system (Vachon, Kristjanson & Higgins, 1995) in addition to their concern to share their emotions with the medical staff in order not to be a burden or to take the attention from other patients (Becvar, 2005). Patients are also concerned about the social stigmatization that accompanies the disease, especially once the disease is visible (Knapp-Oliver & Moyer, 2009) what becomes a central source of distress, especially since cancer patients give a lot of weight to social support as a coping aid (Chochinov et al., 2000; Molen, 2000; Mitchell, 2000). Patients might also feel that a new identity is being imposed on them, what creates a deep

feeling of loneliness. Feelings of belongingness to the "community of cancer patients" become part of the patient's everyday life, leading to thoughts of being distant and isolated from the rest of the world (Little, Jordens, Paul, Montgomery & Philipson, 1998). A cancer patient becomes therefore part of what Frank (1995, pp 8-13) called "society in remission". Also the hospitalization itself prevents many patients from leading their normal lives, while some patients, because of loss of self esteem, choose to isolate themselves intentionally, what disconnects them even further from the external reality (Rydahl-Hansen, 2005; Krieger & Bascue, 1975). Whether a patient is hospitalized, treated in an out-patient clinic or in palliative care seems to have a different impact on the patient's psychosocial-distress since patients treated in palliative care settings suffer from the highest rates of distress (Herschbach et al., 2008).

1.3.3. The philosophical-existential dimension

The philosophical-existential dimension includes dealing with the meaning of the end of life, self annihilation, feelings of worthlessness, emptiness, remorse, disruption of self identity and death anxiety (Little & Sayers, 2004; Breitbart & Heller, 2003; Blinderman & Cherny, 2005). Very many patients might feel a deep sense of suffering and emptiness, anger toward God for deserting them or guilt about being punished for something wrong that they might have done (Johnson-Taylor, Outlaw, Bernardo & Roy, 1999). The physical and psychosocial losses might threaten the patient's sense of integrity and continuation, leading the patient to the feeling that his identity is about to be erased (Block, 2001). Cancer is in fact a crisis in the self's sense of existence, a break in identity and a disruption of the individual's memory. The memory that is disrupted is a disruption of the coherent sense of life's sequence, "the whole that comprises future, present and past" (Frank, 2005, p. 60). One cancer patient wrote about his experience once first diagnosed with cancer. He described being "paralyzed by what I would then have called intense anxiety. When the diagnosis was confirmed, the anxiety took

off its' mask and revealed itself to be abject terror, a fear I had not felt before and which has haunted me ever since" (Craib, 2003, p. 286). Many patients start therefore to deal with questions about the meaning of their lives, about whether they achieved something meaningful in the course of their lives, also trying to find solace and comfort in leaving a legacy, something that will create continuity even after their death (Dobraz, 2002; Hunter & Rowles, 2005). Patients tend to get into a "self examination", trying to find some sense of purpose and transcendence, a sense of being part of something that is bigger than the self, thus maintaining a sense of value in a universe that has meaning, order and control (Greenstein & Breitbart, 2000; Breitbart, 2002). Summarizing, cancer as a potential life threatening illness seems to create a confrontation with the self, its meaning and with the emotional suffering that is involved in dealing with the threat of the separation from life. Death emphasizes life and gives life its meaning, a meaning that is not obvious anymore but one that needs to be urgently discovered (Breitbart, Gibson, Poppito & Berg, 2004).

1.4. Coping with the disease

Coping is rooted in the question of how people react and deal with stress, agreed by nearly everyone to be a crucial variable in understanding the effect of stress on health (Aldwin, 1994). The concept of coping is found in different theoretical literatures, traditional ones and modern ones. From the traditional approaches, the concept of coping can be derived from animal experimentation, from psychoanalytic theories, from theories that conceptualize coping as a personality trait and from theories that focus on situational factors (Folkman & Lazarus, 1980). Within the animal model, coping is defined as acts that control aversive environmental conditions, thereby lowering psycho-physiological disturbance. The animal model of coping was overall considered to be too simplistic and lacking the cognitive-emotional richness and complexity of the human functioning. In the psychoanalytic model, coping refers to the highest and most advanced or mature ego processes, followed by

defenses, which refer to neurotic modes of adaptation, while at the bottom, one can find regressive or psychotic levels of ego functioning. Coping was therefore seen as a defense system whose purpose is to reduce tension and restore equilibrium in the organism (Menninger, 1963; Haan, 1969; Vaillant, 1977 as cited in Monat & Lazarus, 1991).

Psychoanalytical theories focused mainly on the concept of *Defense (Abwehr)*, an unconscious intra-psychic mechanism used by the individual in order to reduce anxiety, thus viewed as a normal regulating system, especially while dealing with an illness (Lang & Faller, 1998). Defense was also viewed as a replacement of the "escape reflex", a defense mechanism needed once dealing with a potentially traumatic experience such as illness (Freud, 1926 in Schwarz & Singer, 2008). Another way to conceptualize coping was as a personality trait, viewing coping as a style or trait associated with vulnerability or resilience to stress rather than a dynamic ego process that takes into consideration the change across stressors and environmental demands across time. (Loevinger, 1976; Shapiro, 1965; Vaillant, 1977 as cited in Monat & Lazarus, 1991). Trait measures were therefore found to be poor predictors of coping processes (Cohen & Lazarus, 1973). This model of coping, although taking into account human's complexity, referred to traits that were usually narrow in scope, underestimating the variability and complexity of actual coping efforts within a specific threat context, thus emphasizing the stable components of coping but not its changing ones (Lazarus & Folkman, 1984). The last traditional view of coping was the situational-oriented one, describing coping according to the nature of the stressor itself. As a consequence, coping strategies were grouped into functional categories (e.g. coping with cancer, coping with burns etc.) without taking into account coping across situations, remaining therefore situation-specific (Folkman & Lazarus, 1980). In response to the limitations within the traditional views of coping as mentioned above, a new definition of coping was given" coping consists of cognitive and behavioral efforts to manage specific external and / or internal demands that are

appraised as taxing or exceeding the resources of the person" (Lazarus & Folkman, 1984). Coping was thus viewed as a cognitive and behavioral effort, constantly changing as a function of continuous appraisal and reappraisal of the person-environment relationship, which are also changing, affected by personality traits or styles but not dominated by them (Aldwin, 1994). This model is constituted from two main processes: appraisal and coping (Folkman & Greer, 2000). The *appraisal process* (the evaluative judgment of the personal significance of the event for the person and of the adequacy of his existing resources of coping) can be divided to primary appraisal and secondary appraisal. The *primary appraisal* refers to the estimation of the stress potential of the encounter, perceiving the stressor as a potential challenge or as a potential threat, also being influenced by the persons' beliefs and values. The *secondary appraisal* refers to the estimation of the individual's resources in dealing with this stressful encounter. In other words, secondary appraisal refers to the extent in which the individual perceives the situation as controllable or changeable (Folkman & Greer, 2000). Based on these appraisals and their emotional consequences, a coping response is chosen (Martz & Livneh, 2007). *Coping* refers to the thoughts and behaviors used to regulate distress, managing the problem causing distress and maintain positive well-being. Coping influences the outcome of the situation and the individual's appraisal of it (Folkman & Greer, 2000). Coping can be divided to different coping styles, mainly distinguishing between problem-focused and emotional-focused coping style (Lazarus & Folkman, 1984). *Problem-focused coping* involves active efforts to manage the stressor itself (e.g. getting more information about the problem and options available to deal with it) and it is normally chosen as a coping reaction when the individual appraises the situation as more controllable. *Emotional-focused coping* refers to coping efforts that do not seek to directly solve the problem but to manage the negative emotions associated with the problem (e.g. engaging in distracting activities, talking about the negative emotions), normally chosen as a coping

reaction when the situation is appraised as less controllable. Additional coping styles later identified were *meaning-focused coping*, in which cognitive strategies are used in order to manage the meaning of the situation, drawing on values, beliefs and goals to modify the meaning of the situation, especially in case of chronic stress that cannot be amenable to problem-focused efforts (Folkman & Moskowitz, 2004). An additional coping style, *social coping* refers to interpersonal coping, in other words-seeking social support (Amirkhan, 1990; Carver, Scheier & Weintraub, 1989). Appraisal and coping processes are influenced by the characteristics of the person and the environment, characteristics that can influence the persons' ability to appraise situations realistically choose the appropriate coping strategy and use it effectively (Folkman & Greer, 2000).

Coping is a crucial aspect in the development and maintenance of well being especially once dealing with an illness. An acute health crisis and its progression is a turning point in an individual's life. The confrontation with a severe physical illness or injury, prolonged treatment and uncertainty has a profound and lasting impact, thus putting in focus the question of whether there are coping strategies that are more influential on the course of a disease (Martz & Livneh, 2007). Cancer is one of those acute traumatic crises since being a complex and accumulative stressful life event, potentially leading also to growth and self-development. The ability of a person to cope with a cancer diagnosis depends on the patient's appraisal of the situation and of the resources available to him once dealing with the situation. The appraisal process once dealing with cancer involves many aspects: the objective meaning of the medical situation (e.g. stage of the disease), the symptoms of the disease (e.g. pain, nausea, anxiety, depression), previous experiences with himself and others (ways of dealing with inter- and intra-conflicts), the situational aspects of the therapy (e.g. type of therapy, patient-doctor relationship), social support, financial situation, religious beliefs, the patient's personal dispositions and the patient's subjective understanding of his situation (Schwarz &

Singer, 2008). In that respect, Haertl et al. (2010) found that objective factors have little to do with subjective well-being among cancer patients and survivors while personality traits (such as neuroticism) and coping appraisal processes (such as initial perceived distress), predict the most, short- as well as long- term effects of the disease on health outcomes and quality of life. Once dealing with cancer, it is important to differentiate between adaptive and mal-adaptive coping strategies. *Denial* is one of those debated strategies. In fact, once dealing with cancer the differentiation between "defense" (Abwehr) and "coping" should be taken into account. Defense in comparison to coping is an unconscious, irrational defense mechanism that focuses on the inner world of the individual incorporating defense mechanisms such as denial, suppression, avoidance, projection and more while coping is a more rational and reality-oriented one (Lang & Faller, 1998). There are existing arguments in respect to the question of whether a defense mechanism (in the form of denial for example) is adaptive once dealing with cancer. Herschbach & Heußner (2008) claimed that denial can have a negative but also a positive influence on the patient' adjustment to disease according to the nature of the denial. In other words, as long as the denial does not jeopardize the compliance of the patients, his communication with family member or crucial social aspects of the disease (such as writing a testimony) it can be perceived as a positive defense mechanism. Denial enhances therefore cancer patient's adjustment to the disease when a positive perspective through the denial is created, decreasing in turn also the stress level of the patient. Denial can be the denial of the diagnosis or of its consequences, mainly used by patients around the time of the reception of the diagnosis, when there is a deterioration of the disease or when there is a recurrence of it. To summarize, it seems that coping with cancer is a complex process, influenced by many factors: the nature of the trauma, the nature of the individual ("resilience"), the available resources, previous crises and the approach to those crises and from the ability to construct a meaning from the whole illness experience (Schwarz & Singer, 2008). The ability to construct

a meaning from the illness experience, to find a positive value from the situation by re-appraising the situation as having provided some benefit, seems to be the key point in creating a positive development from the illness experience, potentially becoming more stabilized and generalized in course of time, affecting eventually the individual's core beliefs about himself and others (Folkman & Greer, 2000). In fact, there is large evidence that cancer survivors associate many positive life changes with their illness experience. The positive effects generated by a stressful life event life cancer are described in very many terms such as: *benefit finding, stress related growth, self transformation* or *posttraumatic growth* (Cohen & Numa, 2011). Regardless of the used term, the concept refers to the positive psychological changes experienced as a result of the struggle with a challenging live event, generating as a consequence a subjective perception of change (e.g. greater appreciation of life, personal strength and more) (Tedeschi & Calhoun, 2004 as cited in Cohen & Numa, 2011). Herschbach & Henrich (1987) as cited in Herschbach & Heußner (2008) for example, found that breast cancer patients during their medical rehabilitation managed to find also positive aspects in their illness experience such as the feeling of having a more intensive and aware life.

Posttraumatic growth/benefit finding seems to emerge mainly out of active cognitive and emotional processing of the traumatic experience. '*Cognitive process*' includes seeking for the meaning of the event, while '*emotional processing*' is an attempt to process the emotional feelings evoked by the traumatic event (Tedeschi & Calhoun, 2004 as cited in Cohen & Numa, 2011). Perceived impact of the stressor (the stressor must be disruptive enough to activate a coping response in respect to the stressor) and intentional engagement with the stressor are two conditions that were found to facilitate benefit finding / posttraumatic growth among cancer patients (Stanton, Bower & Low, 2006 as cited in Thornton, Owen, Kernstine & Koczywas, 2011). To conclude, although cancer is an aversive life situation, it can generate, like other stressful life events, positive as well as negative effects on psychological well-being

(Cohen & Numa, 2011) since stress is contextual, involving a transaction between the person and the environment, changing over time, also according to the appraisal of the situation, the chosen coping process and following coping outcomes (Folkman, 2010).

1.5. Religion and spirituality

1.5.1. Evolution of religion and spirituality

The evolution of religion can be seen as a process involving three successive stages, one arising from the other. The first stage was characterized by a primitive form of religion, consisting of the belief in spirits (animism). The second stage was dominated by polytheism as the dominant belief, while the third stage was a highly developed monotheism (Dow, 2006). Religion's evolution seems to be a process of increasing complexity and independence from environment, leading from the stage of primitive religion to modern religions as we know them today. Religion has in fact to compete and to succeed in the struggle for existence in which some traits of a given religion seem to be more resistant than others. In other words, religions are subjects to a selection process, strongly influenced by the environment of a given religion as constituted from the natural environment, social organization, the economical conditions and the political configuration. *Social organization* refers to the changes that occur within a society, leading from a primary society of hunters-gatherers, through a society of early farmers to a modern scientific society as known today. *Natural environment*, especially nature unknown phenomena give rise to different emotions such as fear, which in turn lead to specific forms of religious expressions such as idols, symbols and signs. *Economical conditions* have an impact on religions as long as they are responsible for the prosperity of any given culture. Economical problems may result in several modifications within a religion such as the medieval witch hunt. *Political configuration* may also influence the existence and success of a religion such as the expansion in Christianity as a result of the conquests of the

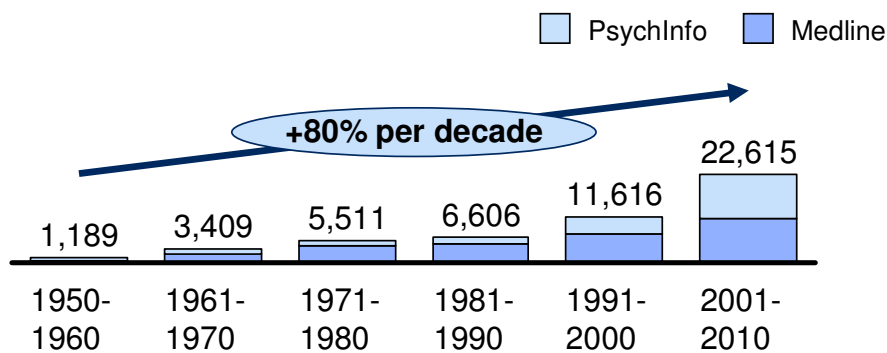
Roman Empire (Wunn, 2003). The mentioned evolutionary process is supported by the evolution of the central nervous system. Humans were added the capacity for complex and symbolic communication, allowing them to share internal representation of the external reality with one another. The most popular of shared models seems to have become what we today perceive as religion. While the human brain evolved biologically, allowing for a more abstract-symbolic way of thinking, cultural adaptation became possible, allowing for the symbols of religion to change culturally, eventually leading to the appearance of the idea of the sacred and to increasing variability and modifications in religion (Dow, 2006). The evolution of religion can be explained not only in biological and socio-anthropological ways but also in philosophical and psychological ones. Religion can be viewed also as a primary condition rather than as a cultural one, a dispositional unique element in the structure of the mind, coming to life from the first moment in which man became conscious of his existence in the universe: "It is as if there were in the human consciousness a sense of reality, a feeling of objective presence, a perception of what we may call 'something there'. [...] He becomes conscious that this higher part is conterminous and continuous with a MORE of the same quality, which is operative in the universe outside of him, and which he can keep in working touch with, and in a fashion get on board of and save himself when all his lower being has gone to pieces in the wreck" (James, 1902 / 1982, pp 58, 508). Jungian psychologist also claimed that the existence of religion is rooted in the collective unconscious and its archetypes, therefore referring to religion as a genetic inherited foundation. However, religion as a prior disposition does not exclude the fact that biological, historical, economical and social changes have an influence on religious experience and expression itself like the discovery of hunting, farming and so forth, thus affecting man's spirituality by affording the mind new ways of embracing reality. Variation in religion can be also explained by human's struggle with questions about the meaning of reality, their existence, questions about where

they come from and where they go to, thus leading to a variety of non-rational responses such as the existence of God and the idea of the holy. Those novel ideas would be retained only if adapted to specific criteria such as habit, rationality, verification, disciplinary interest and so forth (Verkamp, 1991). One form of adaptation applies to the present distinctive use of the terms 'religion' and 'spirituality', terms used interchangeably in the past. In course of time, fluidity in cultures - and countries - boundaries brought alternative beliefs and views from the east, changing as a consequence the meanings of these constructs. Additionally, dissatisfaction from current religious forms created new movements toward bringing more "spirit" to our lives. Those movements' tendencies to get away from institutionalized trends toward more individual and humanistic ones, created the distinction between religion and spirituality as known today (Pargament, 1999).

Within the field of psychology, first studies about the psychology of religiousness started at psychology's early days by pioneers such as William James, Hall and so forth, followed by a decline of the interest in the field from mid 1920s until mid 1960s due to the separation of psychology from the philosophical field and the tendency to stay away from topics that might have been considered too philosophical or theological. In the 1960s there was a re-emergence of the field following the need to use religion in order to understand real life issues such as violence, sexism, prejudice etc. During the 1980s there was an additional growing evidence of the development in the field as seen in the number of textbooks and journal articles written, presentations at professional meetings, courses taught about the psychology of religion etc. During the 1990s the trend replicated and expanded leading to appearance of texts in high-end journals with increasing frequency in addition to new journals that have been established in the field. Special issues such as: religion in the psychology of personality, religion and adult development, religion in the family and so on started to appear. Publications concerning religious aspects of applied work (e.g. religion in clinical work,

religion in psychotherapy, spirituality and treatment etc.) became more and more popular, thus increasing the interest in religion in different sub-fields of psychology (Emmons & Paloutzian, 2003). The state of the discipline today can be characterized as sufficiently developed but still overlooked if not bypassed by the whole of psychology (Hill et al., 2000). A simple search of articles using the terms 'religion' OR 'spirituality' as key words, that was conducted in February 2010 in two main databases 'Psych-Info', and 'Med-line', provides additional evidence of the growing interest in religion and spirituality as research topics over time. The unsorted and unfiltered results show 1,189 articles published during 1950-1960 and 22,615 articles published during 2001-2010. This equates to a growth rate of 80% per decade. While some of this might be due to the fact that more recent articles are captured more consistently in these databases, this still represents a significant growth on the one hand but the insufficiency of researches in the field on the other hand (see Figure 1).

Figure 1: Results for search of keywords Religion OR Spirituality



Conceptually speaking, the evolution of religion and spirituality within the field of psychology started with William James as mentioned. James was convinced that our present consciousness is only one of many worlds of consciousness that exist, and that those other worlds contain experiences relevant for our present life, experiences where higher energies filter in (James 1902/1982). Jung was the next major thinker in the field, interpreting spiritual experiences as a manifestation of the unconscious and as an actual evidence for the existence

of a soul and spirit (Jung, 1940 / 2005). Freud viewed religious belief system as comparable to an obsessive neurotic organization constituted of defense mechanisms erected by the human mind in order to sustain the believers in face of uncertainties of life, the perils of existence and the impending death. Freud saw the relationship of the believer to his God as a regressive model of the child-parent relationship, a relationship constituted from helplessness, dependence, immaturity and impotence from the believer side compared to omnipotence, infinity and majesty from God's side thus seeing religion merely as an illusion existing in order to fulfill the most urgent wishes of mankind (Freud, 1927/1961d as cited in Meisner, 2009). In the 1950's and early 1960's the existential and humanistic psychology treated religious beliefs and spiritual experiences as an important source for human meaning (Frankl, 1992). In the 1980's God's perception was explained in analytic object–relation terms, thus seeing God as a purely psychological construct (Rizutto, 1979). In parallel, two main influential traditions: Buddhism and Hinduism, seemed to have influenced the psychology of religion, producing the first real synthesis between Buddhism and psychoanalysis (Epstein, 1995), while Hinduism influencing transpersonal psychology (Meissner, 2009). Today in western psychology it is common to accept both spiritual and psychodynamic interpretations for spiritual and religious beliefs (Miovic, 2004).

To date, there seems to be numerous reasons for the need to further investigate about religion and spirituality within the field of psychology. First, there are many indications (e.g. from surveys) suggesting that religion and spirituality are potent forces in the lives of many people (Gallup & Castelli, 1989). Second, neither science nor philosophy proved or disproved the existence of a soul or a spirit, so that the nature of consciousness, and its spiritual components remains to be checked, leading to the need to investigate about religion and spirituality as part of psychology's goals to research and understand the human mind (Miovic, 2004). Third, religion and spirituality are related to cognitive phenomena, social phenomena,

affect and emotion and to the development of the personality across the life span, thus being in parallel to the various existing fields of psychology (Hill et al., 2000). Additionally, psychology and religion, both share a mutual interest: understanding human's suffering and finding ways to ameliorate it. Within religion, hardship, suffering and conflicts have always been of major interest: within Buddhism existence itself is perceived a suffering (Dukkha), a term that embodies physical and mental pain from birth to death. Within Judaism suffering is recognized through oppression and persecution while within Christianity a model of suffering is presented through the crucifixion of Jesus Christ. Therefore it seems that religion is in fact concerned about the human basic condition of suffering and with the vision of how one should be responding to this suffering, just as psychology is concerned with similar questions. Last, religion and psychology can and should be seen not as contradicting fields but as complementing ones. Psychology might be generally characterized as an attempt to help people gaining more control over their lives by making the unconscious-conscious (psychodynamic approaches), by helping people overcome a variety of conditions perceived as unable to handle through the acquisition of new cognitive and behavioral skills (cognitive-behavioral therapies) and more. However, there seem to be situations in life that are beyond the realm of personal mastery (e.g. infertility or death) in which we are in certain ways powerless. Religion and spirituality help then people dealing with the problem of personal lack of control by directing to a set of frameworks and beliefs that extend beyond the self alone in order to find answers to important questions and give a sense of meaning and purpose also in extreme life situations. Therefore it seems that bridging between religious / spiritual and psychological views; in other words, between human capacities and human limitations is more than a necessity (Pargament, 1997).

1.5.2. Religion and spirituality – definition, points of commonality and distinction

Defining religion and spirituality is a complex task since there seem to be a minimum consensus concerning the meaning of these constructs and their measurement, generally distinguishing between religion and spirituality (Hill & Pargament, 2008), as part of the rising secularism in the last 20th century in addition to the growing disillusionment with religious institutions in the western society (Turner, Lukoff, Barnhouse & Lu., 1995 as cited in Hill et al., 2000).

The term *Spirituality* derives from the Latin word ‘Spiritus’ which means ‘breath’ (Schmidt, 2004) and refers to an increasing range of experiences, not always having a transcendental reference point, distinguishing between religious spirituality (God-oriented spirituality), natural spirituality (world-oriented spirituality stressing one's relationship with ecology or nature) and humanistic spirituality (people-oriented spirituality, stressing human achievement or potential) (Emmons & Paloutzian, 2003). Spirituality may be therefore part of a faith / religious community (religious spirituality) but not necessarily, incorporating also non religious meanings (natural / humanistic spirituality) (Gorsuch & Miller, 1999 as cited in Miller, 1999). Narrowly defined, spirituality can be defined as a search for the 'sacred' in life through any life experience or route (Mytko & Knight, 1999). This search can be expressed traditionally (within a specific religious context) or non-traditionally (e.g. through art or meditation) (Pargament, 1999). The sacred refers not only to the divine, higher powers or God but to qualities that are linked to the divine such as holiness, blessedness, transcendence, omnipotence and infinitude (Pargament, 2002). Broadly defined however, spirituality can be seen as a search for connectedness with the essence of life (Girardin, 2000 as cited in Visser, Garssen & Vingerhoets, 2009), with the self, a community, nature or a higher being, encompassing a range of terms such as: purpose, authenticity, wholeness, transcendence, joy,

peace and so forth regardless of one's participation in an organized religion or as a search for the sacred in life (Mytko & Knight, 1999). Within this definition of spirituality, the experience of meaning in life is perceived as a central element, since the need for meaning seems to make up the spiritual component of the human experience. Sustaining a sense of meaning in one's life allows a sense of peace and contentment, thus facilitating a self-transcendence and sense of connectedness with others and with what is greater than oneself (Breitbart & Heller, 2003). *Meaning* itself can be defined as the "cognizance of order, coherence and purpose in one's existence, the pursuit and attainment of worthwhile goals and an accompanying sense of fulfillment" (Reker, 1988 as cited in Fleer et al., 2006, p. 705). Meaning in life influences peoples' understanding of the past and the present, determining what is important in life and generating expectations about the future, according to prior priorities and goals (Fleer et al., 2006).

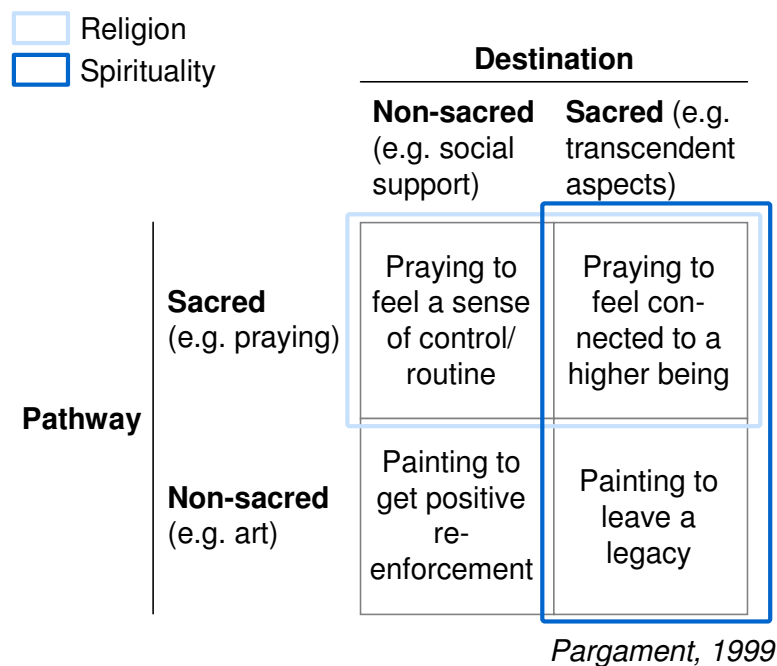
Religion on the other hand derives from the Latin word 'Religare' which means to tie, to attach, to unite, suggesting a process of rebinding and reconnecting, although not sure whether the connection is to God, nature, a state of mind, a cosmic force or other individuals. Religion can therefore be seen as a way of being and becoming in the world, a movement involving forming and reforming of relationships that include within or among them a presence that is considered divine (Schlauch, 2006) or as James (1902/1982, p. 28) stated: "religion is the feelings, acts and experiences of individual men in their solitude, so far as they apprehend themselves to stand in relation to whatever they may consider divine". Religion can therefore be seen as a social phenomena, constituted from a community of people sharing beliefs and practices, a special moral commitment underlined by a belief in a higher being, higher power and force that is beyond human beings since being pure, eternal, and omnipotent (Schlauch, 2006). Religion can thus be viewed as constituted from substance and function: *The function of religion* is to serve a number of psychological and social purposes: assisting in

the search for emotional comfort, meaning, intimacy, self development and health and also uniquely assisting in the **search for the sacred**, which is *the substance of religion*. The involvement of the sacred within this search of significance is what transforms beliefs to theologies, behaviors to rituals, relationships to congregations and feeling to religious experiences (Pargament, 2002).

Historically speaking religion used to be a broad construct, encompassing personal religion, institutional religion, the functional and the substantial, the good and the bad. However, there seems to be a growing polarization between religion and spirituality, defining religion as the organizational, the ritual and the institutional while defining spirituality as more personal and sentimental, a search for unity and meaning. Religion becomes therefore marginal and static, while spirituality becomes central and dynamic taking a negative and positive side respectively. Yet the two constructs are related constructs rather than independent ones (Hill & Pargament, 2008). Religion, despite being an institution, is in fact concerned with spiritual matters, while spiritual matters, although not always taking place within a religious context, do take place in some form of social context. Therefore it would be problematic to distinguish between what is absolutely institutional vs. what is absolutely individual. However, points of distinction do exist: religion can be seen, as mentioned, as a search for significance and value in life (psychologically, socially, physically or spiritually speaking) in ways related to the sacred. Every search is made of two dimensions: a pathway and a destination. The sacred can be part of the pathway only or of both pathway and destination. For example, one can be involved in prayers or rituals (sacred pathways) either to reach a sacred destination (e.g. seek out God) or a non sacred destination (e.g. seek social support). Spirituality is on the other hand a search for one and only objects of significance- the sacred, meaning that within spirituality the sacred is part of the destination only or of both the destination and the pathway. For example, one can achieve a sense of connectedness to

something that goes beyond the self (sacred destination) by praying (sacred pathway) or by creating an art piece (non sacred pathway). Spirituality is therefore the heart and soul of religion, being part of a religion that seeks for the sacred as a goal but not of a religion that seeks for non sacred goals (e.g. social support), also existing independently from any religious frame as mentioned (Pargament, 1999) (see Figure 2).

Figure 2: Distinction and overlaps of Religion and Spirituality



Additionally, spirituality, unlike religion, touches also existential-humanistic concepts beyond the search for the sacred per se, concepts related to meaning and purpose in life (Frick, 2005). Last, religion unlike spirituality stipulates behavioral patterns and encourages adherents to practice certain forms of religious expression (Marty & Appleby, 1991 as cited in Hills et al., 2000).

1.5.3. Religion and spirituality as a coping mechanism

1.5.3.1. Religion and spirituality's necessity and uniqueness in relation to coping

When considering the relationship between religion / spirituality and coping, one should be clear about the similarities and differences between the two: coping process is

oriented toward stressful life events, involving religious / spiritual thoughts, practices, feelings and relationships but not necessarily. On the other hand, religion / spirituality may be part of an individual's life in times of stress but not restrictedly only to those times of stress. (Pargament, 1997). Crisis and coping do however play critical roles in the religious / spiritual experience of the individual "during the whole course of this year, when I almost unceasingly kept asking myself how to end the business, whether by the rope or by the bullet, during all that time, alongside of all those movements of my ideas and observations, my heart kept languishing with another pining emotion. I can call this by no other name than that of thirst for God. This craving for God had nothing to do with the movement of my ideas-in fact, it was the direct contrary of that movement-but it came from my heart" (James, 1902/1982, p 153). Religion / spirituality are more likely to be accessed in coping when it is already part of the individual's orienting system also outside times of stress, when their availability for the individual compared to other resources is higher (e.g. for people with limited means such as poor people or other less powerful groups in society) and when confronted with the boundary conditions of existence (Pargament, 1997). It seems that the uniqueness of religion and spirituality as well as their necessity as coping mechanisms becomes clear in response to life's most critical problems, since the 'sacred' has something special to offer when pushed beyond our immediate resources, once confronted with our vulnerability and lack of personal control (Pargament, 2002). Specifically, one could explain the urge to use religion / spirituality in coping by observing human being's existential condition in the world. Human beings are in fact from birth till death in a process of transition, negotiating change always and everywhere, negotiating relationships with oneself and others, yet facing the ongoing task of establishing and reestablishing a sense of continuity with self and others (Schlauch, 2006). Within these transitions in life, human beings become aware of their transitional position in life, in other words, of their temporality on earth, thus creating a deep existential fear of death (Arndt,

Goldberg, Greenberg, Pyszczynski & Solomon, 2000 as cited in Duberstein & Masling, 2000). Human beings are therefore faced with this terror "to have emerged from nothing, to have a name, consciousness of self, deep inner feelings, an excruciating inner yearning for life and self-expression and with all this yet to die" (Becker, 1973, p xii). Thus, a need for a "transitional object", a safe object, exterior to the individual but yet integral to him, is created in order to give the individual a sense of comfort and continuity. Those transitional objects have a special status by existing "outside" our transition, and therefore being immutable, eternal, revealing themselves in the space in which we live ("transitional space"), an "intermediate space" existing between reality and fiction (Winnicott, 1971). Religion and spirituality can therefore be seen as a transitional object, existing in between the realm of reality and fantasy, allowing therefore the creation of an "immortality symbol", a symbolic system of ideas, that allows us to transcend death by participating in something of lasting worth (Becker, 1973), or as Keen (1974, p 74) stated "I don't think one can be a hero in any really elevating sense without some transcendental referent like being a hero for God, or for the creative powers of the universe. The most exalted type of heroism involves feeling that one has lived to some purpose that transcends oneself. This is why religion gives him the validation that nothing else gives him. When you finally break through your character armor and discover your vulnerability, it becomes impossible to live without massive anxiety unless you find a new power source. And this is where the idea of God comes in". Religion and spirituality as coping mechanisms therefore cannot be seen as purely psychological, social or physical coping processes that have little to do with religion itself, since religion / spirituality are distinctive phenomena incorporating distinctive terminology using concepts such as infinitude, omnipotence, god, transcendence and more (Pargament, 2002).

1.5.3.2. Religious and spiritual coping – definition

Spiritual coping incorporates two aspects of spirituality: meaning and purpose in life as well as faith / spiritual beliefs. The *meaning component* refers to giving a meaning to the stressful life situation in order to create or maintain a sense of coherence and purpose in life (see p.24 for a broader definition), while the *faith / spiritual beliefs component* refers to the use of a set of existential beliefs e.g. belief in something that goes beyond the self, in order to find comfort and strength in a stressful life situation (Edmondson, Park, Blank, Fenster & Mills, 2008). Spiritual coping therefore refers to the specific use of cognitive, emotional and behavioral techniques in face of aversive life situations, arising out of one's spirituality (Tix & Fraiser, 1998). In other words, spiritual coping refers to the use of techniques such as constructing a positive meaning from the aversive life experience or adapting the existing system of beliefs to the stressful event, thus redirecting goals and activities in order to regain sense in life (Fleer et al., 2006).

Religious coping refers to the use of a person's religion in order to cope with immediate demands of stressful events in order to find meaning, control, comfort, intimacy and life transformation (Pargament, Koenig & Perez, 2000). Religious coping is broadly divided into positive and negative religious coping mechanisms. *Positive religious coping* methods reflect a perception of a secure relationship with God and a belief in a benevolent purpose of life. Examples for positive religious coping methods are "benevolent reappraisal"-redefining the stressor as benevolent and potentially beneficial ("God is trying to show me the right way") or "Religious helping"- attempt to provide religious support and comfort to others. *Negative religious coping* methods on the other hand express a less secure relationship with God and a struggle in the search of significance. Examples for negative religious coping methods are "punishing reappraisal"-redefining the stressor as a punishment from God or "Passive religious deferral"-passive waiting for God to control the situation (Pargament, et al.,

2000). Religious coping is distinguished from global indicators of *religiousness* such as importance of religion, frequency of prayer or church attendance, religious affiliation etc. Religious involvement is not synonymous with religious coping since knowing about an individual religiosity in general does not specify *how* this individual uses his religion in order to understand and to deal with stressors (Ano & Vasconcelles, 2005). According to some points of view, religious coping is regarded as a broader concept than dispositional religiousness, in other words as a way of coping that can be mediated by religious affiliation (providing information about religious coping across religious groups and sub- groups) (Tix & Fraiser, 1998), measured by religious practice and religious orientation (Thune-Boyle, Stygall, Keshtgar & Newman, 2006), supported by religious belief system (Tix & Fraiser, 1998) and generally divided into adaptive and maladaptive coping methods. According to other points of view, however, religious coping is perceived as only one of the numerous aspects of religiosity, making it a subordinate concept (Hill & Hood, 1999 as cited in Chida, Steptoe & Powell, 2009; Idler et al., 2003). Additionally, religious involvement unlike religious coping can be part of an individual's life also independent of stress (Folkman & Moskowitz, 2004). Religious coping is also distinguished from religious outcomes, an outcome such as becoming religious following an aversive life event (Smith, Pargament, Brant & Oliver, 2000).

Both religious and spiritual coping cut across the main types of coping: problem-focused coping, emotional-focused coping and meaning-focused coping thus incorporating emotions, cognitions and practices that can be active or passive, harmful or beneficial. The prevalence of religious / spiritual coping will depend on the cultural context, the type of person (e.g. age, gender) or stressor (e.g. terminal illness) and on situational factors (e.g. type of illness, time since diagnosis etc.) (Thune-Boyle et al., 2006).

1.5.3.3. Religious and spiritual coping in relation to health and well-being among cancer patients

There seems to be a strong relationship between religion / spirituality and physical and mental health, although complex and controversial (Powell et al., 2003). Bergin (1983) found that in some cases a beneficial effect of religion on mental health can be observed, in others a deleterious one and in other cases no relationship at all. Smith, McCullough & Poll (2003) found that greater religiousness is associated with fewer symptoms of depression, while Carone & Barone (2001) claimed that anxiety might be generated by the need to conform to a particular belief system in the mid of a crisis, having in addition also a negative effect on physical health through the refusal of offered medical treatment due to existing religious beliefs. Concerning physical health, Powell et al. (2003) found that in healthy participants there is a strong, consistent and graded reduction in risk of mortality among church attendees, that religion protects against cardiovascular disease mediated by the health life style, but at the same time, that religion or spirituality do not slow the progression of cancer or protect against cancer mortality. Nevertheless, religion / spiritual coping were found to play a central role for patients with a life threatening illness such as cancer (McClain, Rosenfeld & Breitbart, 2003). Spiritual and existential issues are considered by many cancer patients as important and as an integral part of their psychological needs, especially once dealing with their impending death (Efficace & Marrone, 2002; Frick, Riedner, Fegg, Hauf & Borasio, 2006; Greenstein & Breitbart, 2000), delineating themes such as: relationship with God, life affirmation and growth, social support and more (Feher & Maly, 1999; Halstead & Hull, 2001). Many researchers have found significant relations between religiousness and measure of adjustment, symptom management or both among cancer patients, although leading to mixed results (Stefanek et al., 2005). More specifically religion / spirituality were found on the one hand to influence cancer patients' quality of life (Tarakeshwar et al., 2006; Fleer et al.,

2006), and to be related to various aspects of breast cancer adjustment including self reported physical well being (Highfield, 1992), 'fighting spirit' coping style (Cotton, Levine, Fitzpatrick, Dold & Targ, 1999), self esteem and optimism (Gall, 2004), decreased anxiety (Kaczorowski, 1989), decreased depression (Nelson, Rosenfeld, Breitbart & Galietta, 2002) and increased hope (Mickley, Soeken & Belcher, 1992). On the other hand, researchers also suggested that there is no association between religion / spirituality and quality of life (Tate & Forchheimer, 2002) or adjustment to cancer (Nairn & Merluzzi, 2003). Others reported on existing relationships only once mediated by various possible psychological, social and physiological variables such as reduction of behavioral risks, expansion of social support, enhanced hope, optimism and so forth (Hill & Pargament, 2008; Idler et al., 2003) while others even found existing negative impacts on adjustment from religious variables such as frequent church attendance (Weisman, 1976 as cited in Jenkins & Pargament, 1995) and fatalistic religious beliefs (Baider & Sarell, 1983 as cited in Jenkins & Pargament, 1995). Turning to religion was even found to be positively correlated with psychosocial distress and negatively correlated with psychosocial adjustment (Ben-Zur, Gilbar and Lev, 2001) and with augmented anxiety in patients with breast cancer (Harcourt, Rumsey & Ambler, 1999). The existing controversial results may also suggest that religion can facilitate coping in some patients and impede it in others, reflecting the impact of demographic variables, situational factors and specific religious / spiritual functions, beliefs and practices (Jenkins & Pargament, 1995). Specifically, regarding certain religious / spiritual functions, beneficial effects of religious coping were found among evangelical non catholic women with cancer but not among catholic ones, for whom religious coping was connected to higher levels of distress vs. lower levels of distress among the evangelical ones (Alferi, Culver, Carver, Arena & Antoni, 1999). Additionally, religious orientation was found to have a significant role on cancer patients' well-being. Specifically, intrinsic orientation (experience of religion as an

internalized factor in ones' life) vs. extrinsic orientation (experience of religion as a means of obtaining social / emotional support or status) was found to enhance coping and well-being through higher levels of attributed life meaning (Acklin, Brown & Mauger, 1983).

Connections were also found between religious practice and health status (Hill & Pargament, 2008). Religious practice can be divided into public religious practice (e.g. church attendance, involvement in religious aggregation etc) and private religious practice (e.g. prayer, reading in the bible etc.). Public religious practice was found to have beneficial impact on emotional well being (Francis & Kaldor, 2002) and on self rating of overall health (Schlundt et al., 2008) on the one hand, but to be associated with increased psychological distress on the other hand (Hackney & Sanders, 2003). Private religious practice, in form of praying was found to be a positive coping method for African American women diagnosed with breast cancer (Simon, Crowther & Higgerson, 2007), although depending on the underlying beliefs about praying and the nature of praying (Taylor, Outlaw, Bernardo & Roy, 1999). Those persons for example, who look at prayer to ease suffering and fulfill desires, may experience more negative consequences if the prayer remains unanswered (McCullough, 1995). Prayer for strength, support and guidance from God, on the other hand is associated with less emotional distress (Sherman et al., 2001). Relationships between religious faith / religious beliefs and illness have also been found. Jenkins & Pargament (1995) found that among cancer patients religious beliefs were identified to be associated with decreased levels of pain, anxiety, hostility, social isolation and increased life satisfaction, and also to have beneficial effects on men coping with prostate cancer (Bowie, Syndor & Granot, 2003). Regarding the influence of specific illness and demographic variables, variation in religion / spirituality–health connection may exist between different types of cancer, if taking into account that cancer encompasses a diverse array of illness and the different particular treatments, difficulties and mortality risks that patients face according to the site of the illness. The use of religion or

spirituality as coping resources may also vary with specific factors that influence the possibility of mortality, such as severe or advanced disease, as it may be expected that patients at the crucial times of their illness may rely more on their religion or spirituality, what may also change in time as they adapt to their diagnosis and to the different treatments (Thune-Boyle et al., 2006). Demographic variables also showed some relations to religious and spiritual coping, some also demonstrating specific effects on cancer-related adjustment. Generally speaking, it seems that religious and spiritual coping are used more by women, African-American, older people and by adults with lower socio-economic status. Additional important factors influencing religious-health connections are the functional status of the individual and his religious background (Jenkins & Pargament, 1995). Last, it is important to also take into account the resource variables available to the individual in the form of general coping strategies while evaluating the religion/spirituality-health connections. Stanton, Danoff-Burgh & Huggins, (2002) for example, found that religious coping is advantageous (in terms of enhanced well being) but only for women with low hope.

1.5.4. The present study

1.5.4.1. Purpose of present study

The existing discrepant findings regarding the relations between religion / spirituality and health and well-being could be explained in several ways. One explanation for these inconsistencies may be related to the fact that both religion and spirituality are complex and multidimensional terms, encompassing subjective, cognitive, behavioral, social, emotional and cultural components (Hackney & Sanders, 2003). Moreover there seem to exist fuzzy boundaries between the concepts of 'religion' vs. 'spirituality', often not clearly distinguishing between the two and each of these constructs' components (Carr, 2000; Thoresen & Harris, 2002). An additional issue has to do with the potential confounding between religious coping

methods and non religious coping methods. Religious methods of gaining control for example could be just a reflection of a basic non-religious desire for control on the one hand (Folkman & Moskowitz, 2004) or entail a unique coping dimension on the other hand. This is because of the involvement of the 'sacred' in the coping process, therefore having a powerful and beneficial role in health and well-being, but also potentially able to cause distress (Pargament, 2002). Confusion exists also between religion and spirituality as coping mechanisms vs. religion and spirituality per se, not clearly distinguishing between religion and spirituality as part of the individual's life also regardless of stress and *the use* of this specific religion or spirituality in times of stress (Folkman & Moskowitz, 2004). The fact that religious coping includes measures that can be considered both adaptive and maladaptive further complicates the ability to build an integrative picture about religious / spiritual constructs (Heather, Clifasefi, Marlatt, Blume & Donova, 2006). These different conceptualizations of religion and spirituality have often resulted in different religion / spirituality–health connections found in research (Stefanek et al., 2005), in which stronger and clearer relationships were found when 'religion' was assessed as a specific coping strategy rather than as a global disposition (Zwingmann et al., 2006) and when specific characteristics such as behaviors, beliefs and motivations were taken into account (Thoresen & Harris, 2002). Such specific characteristics further include a patient's religious affiliation (e.g. being Jewish, Moslem, Christian or other) (Gall et al., 2005), religious orientation (e.g. intrinsic vs. extrinsic) (Cole, Hopkins, Tisak, Steel & Carr, 2008), the patient's religious practice (e.g. private vs. public) (Bowie, Sydnor & Granot, 2003; Van Ness & Larson, 2002; Gall & Cornblat, 2002; Taylor et al., 1999) and the patient's religious coping style (e.g. positive vs. negative strategies) (Flores, Hansdottir, Malcarne, Clements & Weisman, 1998). The multidimensional aspects of the term 'religion' have also led to methodological deficiencies and to too many measures used to assess single dimensions of religiosity ranging from public and private religiosity, intrinsic and extrinsic

religiosity, religious denomination, religious meaning and religious coping, resulting in mixed findings as mentioned. Additionally, just as religiosity has been operationalized in a multitude of ways, so have the various outcomes that have been studied in relation to it, also incorporating global indices of psychological functioning (e.g. well-being) rather than more specific psychological outcomes (e.g. satisfaction from a specific domain in life) (Heather et al., 2006). Also the term 'spirituality' was found to be measured with different measurement tools, leading to different results according to the measure of spirituality utilized. In addition to the breadth of measurements, many studies have not provided data on the validity and reliability of those self-reported measures in the first place (Stefanek et al., 2005). Indications about religious / spiritual involvement as being beneficial for cancer patients are also not uniform due to the limited measures of religiousness that are also suitable for cancer patients (Sherman et al., 2001) and the possibility of variation across different types of cancer and severity of disease (Thune-Boyle et al., 2006). Taking into account the different conceptualizations of religion and spirituality and the resulting limitations as mentioned above, the purpose of the present study is to examine religion and spirituality as coping mechanisms for cancer patients and their effect on cancer patients' quality of life, well-being and emotional distress. The aim will be to combine and integrate the mentioned-above contradicting evidence from different primary sources in order to reach reliable conclusions. Specifically, the present study will focus on what we know so far about the role of religion and spirituality in cancer, considering religion and spirituality as separate constructs, taking in to account the different existing forms of religion and spirituality and each of their sub-dimensions in relations to quality of life and emotional distress and each of their sub-types. The present study will also examine variations among different types of cancers' type and stages as well as between different types of patients' characteristics which pose a significant challenge as links between religion / spirituality and health are examined. Achieving clarity

regarding the role of religion in coping with cancer could lead to implications such as improved clinical interventions, in which patient's needs (including their religious and spiritual ones, if existing) can be taken into account, thus providing patients with empathic care, especially during the final phases of life.

1.5.4.2. Research questions

The present study will check whether there are reliable and significant associations between religion and spirituality and cancer's patients' adjustment to their disease. If reliable and significant associations are found to be existing, further examination of the specific forms of religion and spirituality associated with enhanced/worsened quality of life and with reduced / augmented emotional distress will be carried out as well as an investigation of the direction and conditions in which those significant associations can be found. Specifically, two research questions will be carried out:

1) Which forms of religion and spirituality as coping mechanisms are overall beneficial for cancer patients' psycho-social well-being in terms of enhanced quality of life and reduced emotional distress?

2) To whom (e.g. gender, age) and under which conditions (e.g. illness type and stage) are the effects of religion and spirituality beneficial or harmful?

This study will therefore draw on and contribute to the field of religion and spirituality as well as cancer and coping by adding some clarity regarding the role of religion and spirituality in coping among cancer patients in the context of health, illness and health care practice.

2. Methodology

2.1. The research methodology

The research methodology applied to investigate the above-mentioned research questions will be *a systematic meta-analysis*. A meta-analysis is concerned with describing, synthesizing and analyzing research findings within a particular field. Conducting a meta-analysis ensures that the chosen research problem is clearly defined and set within an established context, allowing to examine previous findings and to draw broad, overall conclusions about the chosen topic (Breakwell, Hammond & Fife-Schaw, 2000). In this specific study, a meta-analysis was considered to be the most suitable methodology for answering the question of whether religion or spirituality as coping mechanisms could be beneficial for cancer patients, and if so, under which conditions since a systematic integration of the existing controversial findings in the field and the need for making sense of the vast amounts of data that have accumulated is more than a necessity and couldn't be achieved by any other research methodology.

In principle, the steps involved in a meta-analysis (after defining the research questions, the dependent and independent variables and the population of interest) are as following (Breakwell et al., 2000):

1. Identify and obtain all relevant studies containing information of interest.
2. Code all study characteristics that might be predictors of the study outcomes.
3. Estimate effect sizes (i.e. an index of how important and powerful the relationship between the variables is, using a common metric such as r-coefficient as an expression of the effect size, for example) for the variable pairs (independent–dependent variable).

4. Calculate the mean of effect sizes across studies weighted by the respective sample size of each study (=weighted average).
5. Calculate the variance of effect sizes across studies in order to evaluate whether the primary studies can be considered to stem from the same population or not (homogeneity test) and accordingly, in case of heterogeneity, use a random effect model instead of a fixed one.
6. Examine study characteristics (such as age, gender, sample selection methodology etc.) that correlate with study effects if the study effects cannot be attributed to the relationship between the dependent and independent variables.

In addition, once conducting a meta- analysis, an explicit definition of the *Inclusion Criteria* for the studies that have been selected should be mentioned as well as a referral to the *File-drawer Problem* (publication bias), the acknowledgment that published works represent only a proportion of the research studies conducted, while many other potentially useful studies remain unpublished (Breakwell et al., 2000).

2.1.1. Variables definitions and assessment tools

2.1.1.1. Independent variables and measurement

Spirituality is defined in this study as 'spiritual well being' (Peterman, Fitchett, Brady, Hernandez & Cella, 2002; Brady, Peterman, Fitchett, Mo & Cella, 1999) as comprised from its two subscales:

Meaning / Peace (M/P) – subjective sense that one's life has meaning, purpose and value. The component of M/P can also be referred to as existential well being (EWB).

Faith / Assurance (F/A) - sense of comfort derived from one's faith or spiritual beliefs. The component of F/A can be also referred to as religious well being (RWB).

Spirituality was assessed mainly by the Functional Assessment of Cancer Therapy Spiritual - FACIT-SP (Cella et al., 1993) and by the Spiritual Well Being Scale (SWBS) (Ellison, 1983). The FACIT-SP was developed from the Functional Assessment of Cancer Therapy General (FACT-G) to assess spirituality among cancer patients. Subsequently the 12 item FACIT-SP was developed, leading after a principal components analysis with Varimax rotation to the presence of the two factors mentioned above. The M/P factor contain eight items while the F/A one four items. The internal consistency of this measure was Cronbach Alpha of 0.87 (Cella, 1997 as cited in Cotton, Levine, Fitzpatrick, Dold & Targ, 1999), for the M/P subscale 0.81 and for the F/A subscale 0.88 (Brady et al., 1999). The Spiritual Well Being scale (SWBS) is comprised of 20 items measuring spiritual well being divided to the two components mentioned above although named *Existential Well being (EWB)* and *Religious Well Being (RWB)*, measuring meaning and purpose in life and a sense of well being in relation to faith respectively (Carson, Soeken, Shanty & Terry, 1990). Internal consistencies for the entire scale were Cronbach Alpha of 0.89, for the EWB scale 0.78 and for the RWB scale 0.87 (Ellison, 1983). Additional measures for assessing spirituality in this study can be seen in Table 1.

Table 1: Tools to measure spirituality

Assessment tool	Function of tool	Reliability (alpha Cronbach)	Reference
The Life Attitude Profile – Revised (LAP- R) questionnaire	a 48- items questionnaire measuring current and future meaning and purpose in life	0.77 to 0.91	Recker & Peacock, (1981)
The JAREL Spiritual Well Being Scale	A questionnaire constituted from 21 items assessing faith, life/self responsibility and life satisfaction / self - actualization.	0.79 to 0.91	Hungelmann, Kenkel-Rossi, Klassen & Stollenwerk (1989)

To summarize, internal consistency of the measures used to assess spirituality in those articles collected for this study ranged between 0.77 and 0.91. In other words, the assessment tools used to measure spirituality in this study have a high internal reliability

Religion is defined for the purpose of this study as ¹*religious coping* vs. *religiousness* per se (Pargament et al., 2000). Measures of religious coping specify how the individual is making use of religion in order to understand and deal with stressors. Religious coping is comprised of different coping mechanisms broadly divided to *positive religious coping* and *negative religious coping* mechanisms referring to adaptive vs. non adaptive coping strategies

¹ *Religious coping* refers to specific coping mechanisms used as derived from ones' religion vs. *Religiousness* which refers to a global disposition denotes religious involvement in general, religion as a personal trait.

respectively. Religious coping was assessed in this study mainly with the RCOPE (Pargament, Koenig & Perez, 2000), a measurement including 105 items from the 21 subscales / coping mechanisms, divided into the two global factors mentioned above with an internal consistency of Cronbach Alpha 0.78-0.87 for the global scale and 0.91 for positive religious coping vs. 0.70 for negative religious coping (Plante & Sherman, 2001). Additional tools used to measure religious coping in this study can be seen in Table 2.

Table 2: Tools to measure religious coping

Assessment tool	Function of tool	Reliability (alpha Cronbach)	Reference
The Religious Coping Activities Scale (RCAS)	Monitors 6 types of religious coping / scales as constituted from 31 items.	reliability for all six subscales ranged from 0.61 to 0.92	Pargament et al. (1990)
Religious Problem Solving Scale (RPSS)	36 items that measure 3 approaches / scales to solving problems in life within a religious framework	Internal consistency for the three scales: 0.91 to 0.94	Pargament et al. (1988)
The Religious and Spiritual Attribution (RSA)	A 10 item measure of causal and coping attributions related to life events	Internal consistency of alpha Cronbach of 0.76	Pargament & Hahn (1986)
The Multi dimensional Measure of Religion / Spirituality (MMRS)	Constituted from 6 items, with two scales, one for positive coping mechanisms and one for negative ones	Internal consistency of 0.81 for the positive scale and 0.54 for the negative one	Idler et al. (2003)
The Spiritual Involvement and Belief Scale- revised	A 26 items questionnaire for religious coping measurement	Internal consistency of 0.92	Hatch, Burg, Naberhaus & Hellmich (1998)

the religious scale of the Ways of Coping Inventory (WCI)	Measure of religious coping mechanisms	Internal consistency of 0.78	Folkman & Lazarus (1985)
The Religious Comfort and Strain Scale (RCSS)	Measure of religious coping mechanisms	Internal consistency ranging from 0.67 to 0.87	Exline ,Yali & Sanderson (2000)

To summarize, the internal consistency of the assessment tools used to measure religious coping in this study were mostly of alpha Cronbach of 0.7 or more with two exceptions: the negative scale of the multi dimensional measure of religion-spirituality (alpha Cronbach of 0.54) and one of the subscales of the religious coping activity scale (alpha Cronbach of 0.61). In other words, most of the assessment tools used to measure religious coping in this study have a high internal reliability.

Religiousness, a global measurement of an individual's religiosity, can be divided to the following sub-types: religious affiliation, religious support (e.g. frequency of talking to a priest or church members for support), religious practice (private & public), perceived image of God, religious orientation (importance of religion in one's life), religious faith and general religiosity (e.g. how religious one considers himself to be) or can be taken together as one global measurement of an individual's religiosity. Within this study, the different sub-types of general religiousness were measured by the tools outlined in Table 3.

Table 3: Sub-types of general religiousness

Sub-type of religiousness	The assessment tool	Function of tool	Reliability (alpha Cronbach)	Reference
Religious affiliation	The Social Network Index (SNI)	Assess social relationships with members of religious groups	Internal reliability of 0.82	Cohen, Doyle, Skoner, Rabin & Gwaltney (1997) in Barrera, Toobert, Angell, Glasgow & Mackinnon, (2006)
Religious support	The System of Belief Inventory (SBI)	Includes 5 out of 15 items that refer to religious support	Internal consistency of 0.95	Holland et al. (1998)
	Abbreviated version of the COPE questionnaire	Measures a range of coping strategies in stress situations, including religious ones	Internal consistency of 0.89	Carver, Scheier & Weintraub, (1989)
Religious practice	The Paloma and Pendleton's Prayer Scale (PS)	Identifies the frequency of use of prayer in coping	Inner consistency of 0.85	Paloma & Pendleton (1991)
	Fetzer Multidimensional Measure of Religiousness and Spirituality	A tool constituted of 12 domains, each measuring a different aspect of religiousness	inner consistency of 0.70	F.I.N.I.o.A.W. Group (1999) in Hamrick & Diefenback (2006)
	The Adapted Prayer Scale (APS)	Measure for prayer activity, prayer experience and attitude toward prayer	Internal consistency of 0.96	Meraviglia, (2002)
	Abbreviated version of the COPE questionnaire	Measures a range of coping strategies in stress situations, including religious ones	Internal consistency of 0.89	Carver, Scheier & Weintraub, (1989)

Sub-type of religiousness	The assessment tool	Function of tool	Reliability (alpha Cronbach)	Reference
	The Duke University Religious Index (2 specific items)	A measurement for organizational (e.g. church attendance) and non-organizational (e.g. prayer)religious practice	internal consistency of 0.78	Koenig, Meador & Parkerson, (1997)
Religious orientation	The Age of Universal I-E Scale 12	Measures intrinsic and extrinsic religious orientation	Internal consistency of 0.66 for the intrinsic subscale and 0.73 for the extrinsic one	Gorsuch & Venable, (1983) in Maltby (2002)
	The Reliance on God's help (RGH)	Measures prayer / trust in God	Alpha of 0.917	Buessing, Fischer, Ostermann & Matthiessen (2009)
	The Duke University Religious Index (three specific items)	Measures intrinsic religiosity	Internal consistency of 0.78	Koenig, Meador & Parkerson (1997)
	The Social Network Index	Measures importance of religion and spirituality	Internal reliability of 0.83	Berkman (1977) in Purnell, Andersen & Wilmot (2009)
	The Scale of Personal Religiousness (SPR)	Measure for religious orientation	Alpha Cronbach of 0.82	Jarowski (1989) in Janiszewska et al. (2008)

Sub-type of religiousness	The assessment tool	Function of tool	Reliability (alpha Cronbach)	Reference
	The 10-items Centrality Scale (C- SCALE)	Measures the degree of intrinsic religiousness that guides one's daily life	Internal reliability of 0.94	Huber (2003) in Zwingmann, Müller, Körber & Murken (2008)
Religious faith	The Santa Clara Strength of Religious Faith (SCSORF)	A 10 item scale assessing strength of religious faith	Internal consistency of 0.95-0.97	Sherman et al. (2001)
	The Religious Belief Index (RBI)	Measures for religious beliefs (e.g."religion is important to my day to day life")	Internal consistency of 0.92	Yates, Chalmer,St. James, Follansbee & McKegney (1981)
	The religious coping portion of the COPE	Measures a range of coping strategies in stress situations, including religious ones	Internal consistency of 0.89	Carver, Scheier & Weintraub (1989)
Image of God	The God Image Scale (GIS)	Explores issues of belonging, goodness and control in respect to God	Internal reliability of 0.56 to 0.82	Lawrance (1997)
	The God Image Descriptors (GID)	Explores internal models of the sort of person that the individual imagines God to be	Internal consistency of 0.75 - 0.92	Gorsuch (1968)

To summarize, internal consistency of the measures used to assess religiousness in its different forms in this study ranged between 0.56 to 0.97, with most of the studies having an internal reliability of 0.7 or more with two exceptions: the God image scale (alpha Cronbach of 0.56 for one sub-scale) and the Age of Universal I-E Scale 12 (alpha Cronbach of 0.63 for the

intrinsic sub-scale). In other words, most of the assessment tools used to measure religiousness in this study have a high internal reliability.

2.1.1.2. Dependent variables and measurements

Quality of life in this study was measured mainly by the Functional of Cancer Therapy (FACT) with internal consistency of 0.68-0.80 according to the specific subscale (Fairclough & Cella, 1996). Additional tools to measure quality of life in this study are summarized in Table 4.

Table 4: Tools to measure quality of life

Assessment tool	Reliability	Reference
The McGill Quality of Life Questionnaire	Internal consistency of 0.80	Cohen, Mount, Strobel & Bui (1995)
The SF-12 and the SF-36	Reliability of physical and mental summery scores usually exceeding 0.90	Ware, Kosinsky & Keller (1996) Ware (n.d)
The EORTC QLQ C-30	Internal consistency of 0.52 to 0.89	Aaronson et al. (1993)
The Functional Living Index Cancer (FLIC)	Internal consistency of 0.65 to 0.87	Schipper, Clinch, McMurray & Levitt (1984)
The QUAL-E	Internal consistency of 0.83	Steinhauser et al. (2002)
The Satisfaction with life scale (SWLS)	Internal consistency of 0.87	Diener, Emmons, Larsen & Griffin (1985)
A modified version of the Brief Multidimensional Student's Life Satisfaction Scale (BMSLSS)	Internal consistency of the original version of 0.68 to 0.75	Huebner, Suldo, Valois, Drane & Zullig (2004)
Life satisfaction questionnaire (LSQ)	Internal consistency of 0.89	Carlsson & Hamrin (1996)
The Index of Well Being (IWB)	Internal consistency of 0.89	Campbell, Converse & Rodgers (1976)

Emotional distress was measured mainly by Profile of Mood State (POMS) with internal consistency of 0.63 to 0.96 (McNair, Lorr & Droppelman, 1971 as cited in Rasmussen & Jeffry, 1995), by the Brief Symptom Inventory (BSI) with internal consistency of 0.71 to 0.85 (Derogatis & Melisaratos, 1983) from which the Global Severity Index (GSI)

was also used, with internal consistency of 0.81 for the anxiety subscale and 0.85 for the depression one. Additional tools used can be seen in Table 5.

Table 5: Tools to measure emotional distress

Assessment tool	Reliability	Reference
Hospital Anxiety and Depression Scale (HADS)	Internal reliability of 0.85 for depression and anxiety together and 0.87 for anxiety and 0.75 for depression separately	Baldacchino, Bowman & Buhagiar (2002)
The Beck Hopelessness Scale (BHS)	Internal reliability of 0.94	Beck, Weissman, Lester & Trexler (1974)
The Psychological Adjustment to Illness Scale (PAIS)	alpha coefficient of 0.87	Derogatis (1986)
The State – Trait Anxiety Inventory (STAI)	Internal consistency of 0.86	Spielberger, Gorsuch, Lushene, Vagg & Jacobs (1983)
The Beck Depression Inventory for Primary Care (BDI-PC)	Internal consistency of 0.85	Steer, Cavalieri, Leonard & Beck (1999)
The Center for Epidemiological Studies Depression Scale (CES-D),	Alpha coefficient of 0.85 to 0.90	Radloff (1977)
and the Impact of Event Scale (IES)	Reliability of 0.82 to 0.86	Sundin & Horowitz (2002)
The Symptom of Distress Scale (SDS)	Internal reliability of 0.79 to 0.89	McCorkle (1987)
The Schedule Attitude Hastened Death (SAHD)	Internal reliability of 0.89	Mistakidou et al. (2008)
The Hamilton Rating Scale for Depression (HDRS)	Internal reliability of 0.79	Lopez – Pina, Sanchez- Meca & Rosa Alcazar (2009)
The Mini- Mental Adjustment to Cancer (Mini MAC)	internal reliability of 0.62 to 0.87 (according to subscale)	Watson et al. (1994)
The Mental Adjustment to Cancer (MAC)	Internal reliability of 0.81 to 0.91	Mistakidou et al. (2005)

Assessment tool	Reliability	Reference
Escape from Illness Scale (ESCAPE),	Internal reliability of 0.73	Büssing, Ostermann, Neugebauer & Heusser (2010)
The Medical Outcomes Study 5-item Mental Health Index (MHI)	Internal reliability ranging from 0.67 to 0.95	Berwick et al. (1991)

To summarize, internal consistency of the measures in this study ranged therefore between 0.52 to 0.90 for quality of life and between 0.62 to 0.91 for emotional distress, In other words, regarding most of the assessment tools in this study, a high internal reliability could be observed.

2.1.2. Data collection

2.1.2.1. Search Strategy

Studies were collected by performing a computerized search of journal articles using three main databases: Medline, Psycinfo and Pubmed, databases containing high quality studies with no time or language restrictions. In addition to the electronic search mentioned above, a manual search within reference lists of identified studies was also conducted. Search for unpublished studies was also performed through contacting colleagues around the world via email, asking for help in identifying relevant unpublished studies (e.g. contacting researchers that published a relevant abstract of their work in the last IPOS 11th world congress of psycho- oncology). Additionally, two authors that published five or more papers in the field (Pargament K. and Gall T.L.) were contacted for unpublished material and for their own references (both replied). Within the computerizes search, the search was performed on the 20th of February 2010, covering published material from 1950 up to today. The

following key words were used: religion, spirituality, religious coping, spiritual coping, religious affiliation, religious practice, prayer, church attendance, religious orientation, religious faith, religiousness, religiosity, meaning, spiritual beliefs, religious beliefs, coping, cancer, oncology, quality of life, well being, emotional distress, depression and anxiety. Using the Boolean operator "AND "and "OR", the mentioned above key words were combined in all possible combinations (e.g. cancer & religion, coping & religion etc.). Studies were excluded if they were performed on children and adolescents, case reports, dissertations, books and book chapters.

2.1.2.2. Screening Procedure

After applying the search strategy as mentioned above the process of selecting the relevant studies was implemented. **Inclusion criteria** were set as following:

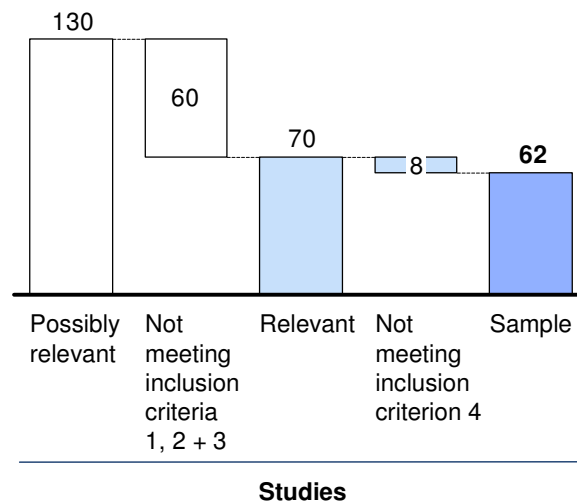
1. *Single empirical studies* only (qualitative studies, Meta reviews and Meta analysis were excluded).
2. Target: population of *cancer patients* only.
3. Studies examining the *relationship* between the independent and dependent variables.
4. Methodology complied with a *quality rating system* (e.g. description of sample demographics, description of outcome measures or use of validated instruments and so forth) according to a specific list of criteria as published by Moncrieff, Churchill, Drummond & McGuire (2006).

In order to be included in the meta- analysis a study had to fulfill all main criteria mentioned above.

In total 5848 studies were identified (Pubmed: 1990, Medline: 3100, Psychinfo: 758). After checking overlaps, availability of full text and after excluding studies performed on children and adolescents, case reports, dissertations, books and book chapters, 130 possible

relevant studies remained. From those 130 articles 60 articles didn't reach criteria number one to three. 70 potential articles remained, of which 8 did not fulfill inclusion criterion number 4, thus ending up with 62 relevant scientific studies as can be seen in Figure 3.

Figure 3: Description of screening procedure



All included studies were coded with up to 30 parameters per study such as sample size, illness and demographic characteristics, methodology used, relevant statistics and more (for more information refer to 'coded data' in the appendix).

2.1.3. Statistical analyses

The statistical parameters of the included studies (e.g. beta values) were transformed into effect sizes in the form of an r coefficient when not reported as such in the original study. The transformation was computed using the Meta Win Program 2.0 and its statistical calculator as explained in the Meta Win Manual (Rosenberg, Adams & Gurevitch, 2000). If more than one effect size was present in one study with regard to one outcome measure, the arithmetic 'mean' of the effect sizes was used. If a primary study only noted "not significant", a conservative assumption of a p value of 0.5 and an effect size of 0 was made. Once having effect sizes for each of the single studies calculated, a weighted mean of effect sizes was calculated for the specific pair of dependent- independent variables (e.g. religion-quality of

life, spirituality quality of life etc.) under a fixed effects model (a model that assumes that all the effect sizes arise from the same population) . Effect sizes were computed in r coefficient values using the Comprehensive Meta Analysis program as founded by the U.S. national institute of health (Borenstein, Hedges, Higgins & Rothstein H., 2005). Homogeneity of those means of effect sizes was also tested using a Q statistic. Heterogeneity was assumed when the null hypothesis (study effect sizes are homogeneous) had to be rejected with the likelihood of 90% or more. In cases where heterogeneity was present, the effect sizes were computed under a random effects model (a model that assumes that the effect sizes cannot be perceived as deriving from the same population, thus taking this variability into account once checking the effect size). Subsequently, the significance levels and confidence intervals of the effect sizes were computed. Sub-groups analysis were then performed in order to detect significant effect sizes in sub groups (e.g. among women) and the potential differences in effect sizes between different sub-groups under a specific category (e.g. under the category of 'gender', checking differences in effect sizes between men'- and women- sub-groups) following the steps mentioned above. To address the so called "file drawer problem" (publication bias), meaning the extent to which non significant results are more likely to remain unpublished, Fail-Safe N calculation was computed. The computation of the Fail-Safe N was done only regarding those pairs of dependent-independent variables (e.g. spirituality-quality of life) for which significant effect sizes were found. The computations of the Fail-Safe N gives us in fact, the number of studies that would be necessary to find (in which the effect size for those pairs of dependent-independent variables is zero) in order to reduce the significance of the effect size found for those pairs of variables in this study to alpha of 0.05 or higher (hence, to a non significant effect size). The computation of the Fail-Safe N calculation was done with the Comprehensive Meta analysis Program mentioned above. For additional information about

each of the methodological steps mentioned above, please refer to the Cochrane handbook (Higgins & Greens, 2006).

3. Results

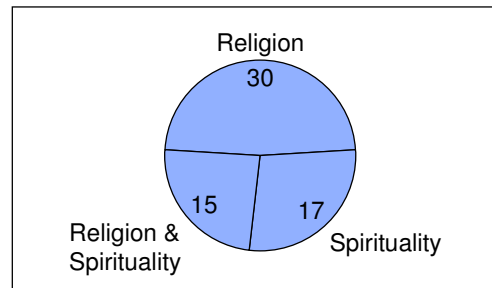
3.1. Sample description

Sixty-two studies fulfilled all main criteria and were therefore included in the analysis (for more information refer to 'sample description' in the appendix). The large majority of the studies were from North America, as can be seen in Figure 4.

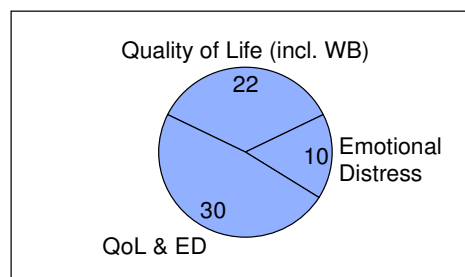
Figure 4: Final research sample by geography of study

Geography of study	n
USA	44
Canada	6
Germany	3
Australia	2
Other ¹	7
Total	62

From those 62 studies, 30 studies analyzed 'religion' (in the form of 'religious coping', 'religiousness' or both) as the independent variable, 17 studies analyzed 'spirituality' as the independent variable and 15 analyzed both 'religion' and 'spirituality' as the independent variable (see Figure 5).

Figure 5: Final research sample by independent variable analyzed

From the 62 studies, 22 studies analyzed 'quality of life' as the dependent variable, 10 analyzed 'emotional distress' as the dependent variable and 30 studies analyzed both 'quality of life' and 'emotional distress' (see Figure 6).

Figure 6: Final research sample by dependent variable analyzed

An overview of the different combinations of dependent- independent variables can be seen in Table 6.

Table 6: Number of studies by dependent - independent variables' combinations (62 studies in total)

		Dependent Variables		
		Quality of life (QOL)	Emotional distress (ED)	Both QOL and ED
Independent Variables	Religious coping (RC)	5	1	4
	Religiousness (REL)	6	3	5
	RC + REL	1	2	6
	Spirituality (SP)	8	3	6
	RC + SP	2	0	0
	REL + SP	1	1	8

As can be seen from Table 6, most of the studies checked relationships of religion and spirituality with both quality of life and emotional distress (29 studies) in comparison to those that checked the relationship with quality of life only (23) and with emotional distress only (10). In addition, spirituality was the variable that was used the most as the independent variable (17 articles) in comparison to the use of general religiousness (14) and religious coping (10). Few studies checked the relationships of both religion and spirituality with the dependent variables (10 studies checking general religiousness and spirituality; two studies checking religious coping and spirituality). Religion in its' two forms (general religiousness

and religious coping) was analyzed in 9 studies. A description of the sample in terms of socio-demographic variables can be seen in Table 7.

Table 7: Description of socio-demographic characteristics by independent variable analyzed (number of studies and % by category)

Socio-demographic characteristics		Independent Variables		
		Religion	Spirituality	Religion and spirituality combined
Mean age		55.77	56.2	55.67
Gender	Male only	2(7%)	3 (16%)	2(14.5%)
	Female only	14(45%)	6(31.5%)	8(57%)
	Majority ² male	5(16%)	2(10.5%)	3(21.5%)
	Majority female	10(32%)	8(42%)	1(7%)
	Not stated			
Marital status	Majority live with a partner	23(74%)	12(63%)	7(50%)
	Majority live without a partner	3(10%)	3(16%)	4(28.5%)
	Not stated	5(16%)	4(21%)	3(21.5%)
Education	Majority high school education or less	16(52%)	8(42%)	6(43%)
	Majority higher	10(32%)	5(26%)	5(36%)

² Majority in this study refers to 51% or more

		Independent Variables		
		Religion	Spirituality	Religion and spirituality combined
Socio-demographic characteristics				
	education			
	Not stated	5(16%)	6(32%)	3(21%)
Ethnicity	White only	2(6.5%)		
	Non white only	2(6.5%)		2(14%)
	Majority white	16(52%)	8(42%)	9(65%)
	Majority non-white	1(3.5%)	4(21%)	1(7%)
	Not stated	10(31.5%)	7(37%)	2(14%)

There were no significant differences between the mentioned above categories (religion, spirituality, religion and spirituality combined) in the mean age of the subjects within the collected studies ($p > 0.05$). There were also no significant differences between the categories in marital status, education and ethnicity. Significant differences between the categories were found only among gender, regarding the sub-category "majority female", in which the category of combined religion and spirituality differentiated significantly from the other two categories (less studies under this category in comparison to the other two, $p < 0.05$). Additionally, it can be seen that there is a strong bias toward women (most of the studies collected included samples of women only or of majority of women-51% women or more), bias toward married subjects, toward high school education or less and toward white subjects among each of the three categories. Overall and regardless of the category, 44% of the studies were done on female only, 29% on a clear majority of female subjects, 11% on male only and

16% on a clear majority of male subjects. Additionally, 56% of the studies were done on subjects who were currently married or living with a partner. 47% of the studies included samples in which the majority of the patients had a high school education or less. Last, 51% of the studies were done on white patients. A description of the sample in terms of illness variables can be seen in Table 8.

Table 8: Description of illness characteristics by independent variable analyzed (number of studies and % by category)

Illness characteristic		Independent Variables		
		Religion	Spirituality	Religion and spirituality combined
Treatment type	Operation only	4(12.5%)		
	Radiation only			
	Chemotherapy only			
	Other treat.	2(6.5%)		1(7%)
	Combined treatment	9(28%)	7(39%)	8(57%)
	Not stated	17(53%)	11(61%)	5(36%)
Cancer stage	Stages 0-2 ³	14(44%)	4(22%)	6(43%)
	Stages 3-4	9(28%)	3(17%)	4(28.5%)
	Not stated	9(28%)	11(61%)	4(28.5%)

³ Stages 0-2 refer to an early stage of cancer while stages 3-4 refer to an advanced one.

Illness characteristic		Independent Variables		
		Religion	Spirituality	Religion and spirituality combined
Cancer type	Breast cancer	15(47%)	4(22%)	7(50%)
	Prostate cancer	2(6%)	2(11%)	2(14%)
	Combined types of cancer	7(22%)	9(50%)	3(22%)
	Other types of cancer ⁴	4(12.5%)	1(6%)	2(14%)
	Not stated	4(12.5%)	2(11%)	
Disease status	Cancer patients	27(85%)	14(78%)	10(72%)
	Cancer survivors	5(15%)	4(22%)	4(28%)
	Not stated			

Overall and regardless of the category, 37.5% of the studies reported on combined treatment type, in other word, on different combinations of treatments (e.g. operation and radiotherapy, radiotherapy and chemotherapy, etc.) given to the subjects within those studies' samples, 11% reported on operation as the only treatment type or on another type of treatment (e.g. hormonal treatment) while 51.5% of the studies did not report on the treatment type at all. 37.5% of the studies, regardless of the category, reported on samples including subjects

⁴ 'Other types of cancer' refers to studies done on patients with a specific cancer other than breast or prostate. These studies differentiate from those studies in which different subjects had different types of cancer (hence, from 'combined types of cancer').

with cancer stages 0-2, 25% on samples including subjects with cancer's stages 3-4 and 37.5% did not report on the cancer stage at all. Overall and regardless of the category, breast cancer was the most common type of cancer reported in 40% of the studies, prostate cancer in 9% of the studies while other types of cancer (e.g. gynecological cancer) were reported in 11% of the studies. 31% of the studies reported on samples including subjects with different types of cancer while 9% of the studies did not report on the cancer type at all. 80% of the studies were done on cancer patients while 20% of the studies were done on cancer survivors. Time since diagnosis was on average 24.6 months for the studies under the category of 'religion', 39.2 for the studies under the category of 'spirituality' and 21.2 under the category of 'religion and spirituality combined', with no significant differences between the categories ($p=0.229$). There were also no significant differences between the categories in treatment type and disease status. Regarding cancer stage, only concerning the sub- category of 'not stated', the category of 'spirituality significantly differed from the other two. Regarding cancer type, significant differences in sub category 'not stated' were found between 'religion and spirituality combined' and the other two categories.

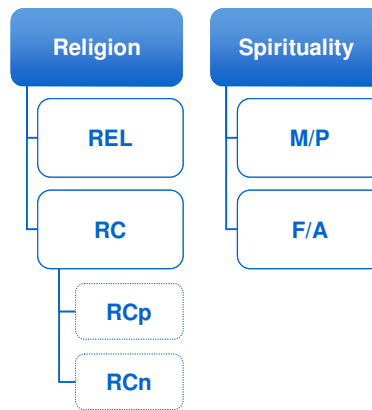
3.2. Results Research Question 1

Which forms of religion and spirituality as coping mechanisms are overall beneficial for cancers patients' psycho-social well being in term of enhanced quality of life and reduced emotional distress?

As a first step toward answering this question, the relationships between the variables' types and sub-types will be graphically presented. As mentioned, the dependent variables within this study are: quality of life (QOL) and emotional distress (ED), while the independent ones are religion and spirituality. Within the independent variables, religion and spirituality, existing sub-types as well as the hierarchy between them will be following

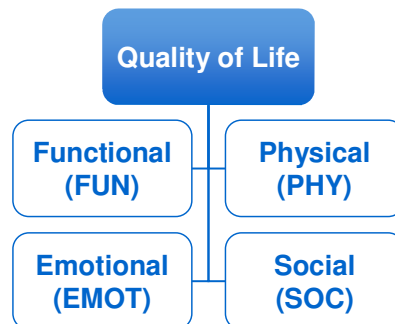
described in Figure 7. The sub- types under the category of 'spirituality' are: meaning / peace component (M/P or EWB) and faith / assurance component (F/A or RWB). Under the term 'religion' are the general religiousness component (REL) and the religious coping one (RC), also divided to its' two components: religious coping positive (RCp) and religious coping negative (RCn).

Figure 7: Hierarchy of independent variables

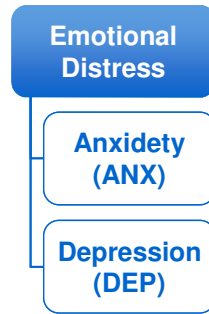


The dependent variable 'quality of life' and its four sub- types: physical quality of life (PHY), emotional quality of life (EMOT), social quality of life (SOC) and functional quality of life (FUN), which constitute together the overall score of QOL , will be described in Figure 8.

Figure 8: Sub-types of dependent variable Quality of Life

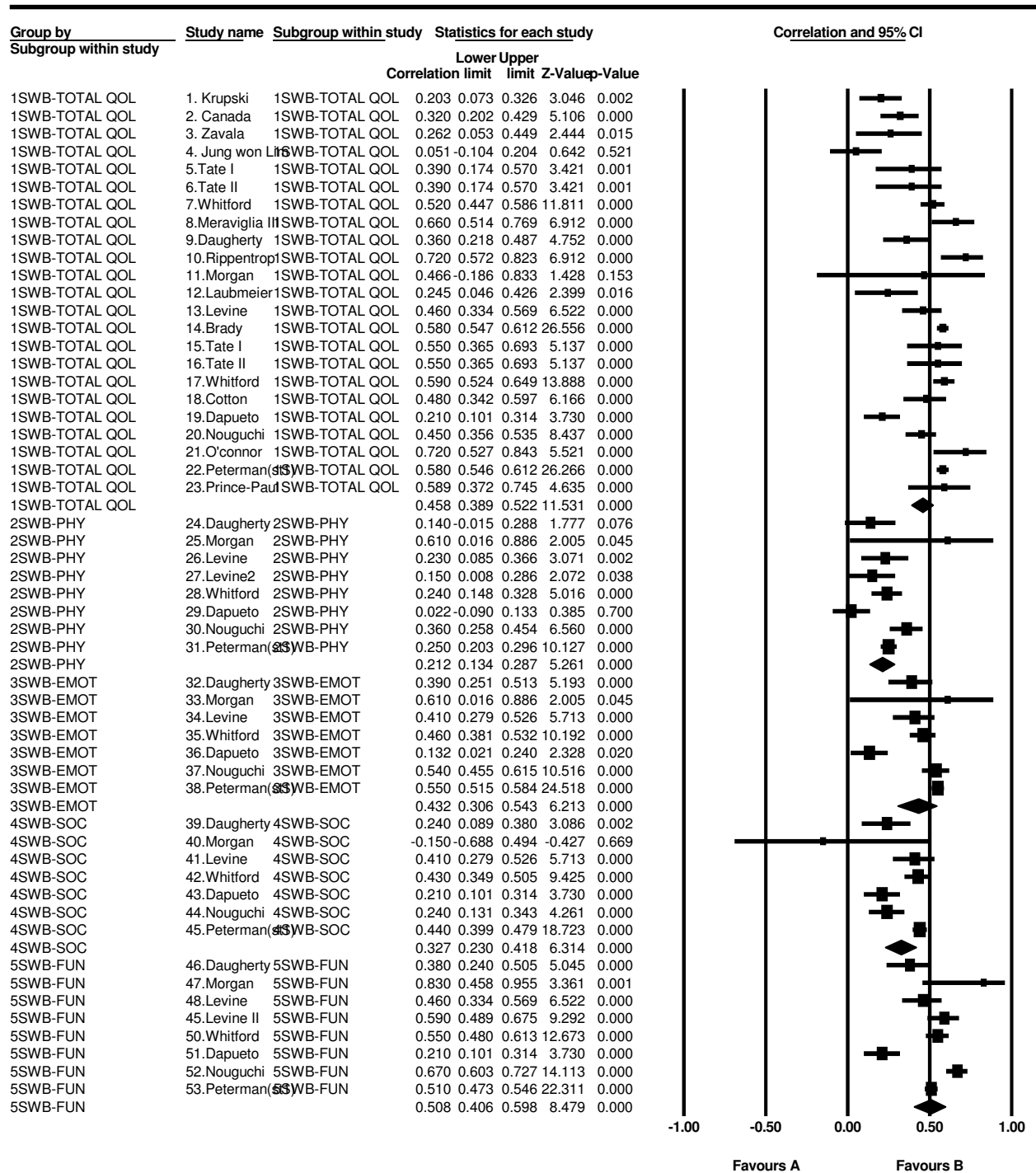


The dependent variable 'emotional distress' (ED) and its two main components: anxiety (ANX) and depression (DEP) can be seen in Figure 9.

Figure 9: Sub-types of dependent variable Emotional Distress

After presenting the dependent and independent variables, their sub-types and the relationships between them, the results of the question: "which forms of religion and spirituality are overall beneficial for cancer patients in term of enhanced quality of life and reduced emotional distress" will be discussed. Corresponding to the "apple and oranges" threat to validity of Meta analysis, meaning the threat of heterogeneity (Sharpe, 1997) it is problematic to aggregate the results of the different outcome measures, which will therefore presented separately. The primary outcomes domains are emotional distress and quality of life. The secondary outcome domains are depression and anxiety (under the category of emotional distress) and physical, emotional, social and functional quality of life (under the category of quality of life). For the interpretation of the magnitude of the effect sizes, the convention established by Cohen (1988) was used, defining an effect size (in form of a correlation coefficient) of 0.1 as a small effect, an effect size of 0.3 as a medium effect and an effect size of 0.5 as a large effect. The following graphs summarize the results of the analysis, presenting the single studies analyzed under each category and their effect sizes as well as the total effect size computed for each of those categories. The confidence interval (95%) as well as the p value for the computed effect sizes will be presented as well, followed by a short explanation regarding the results presented within each of the following graphs.

Graph 1: Spirituality overall score (SWB) with quality of life (QOL) and its' sub-dimensions (PHY, EMOT, SOC, FUN)

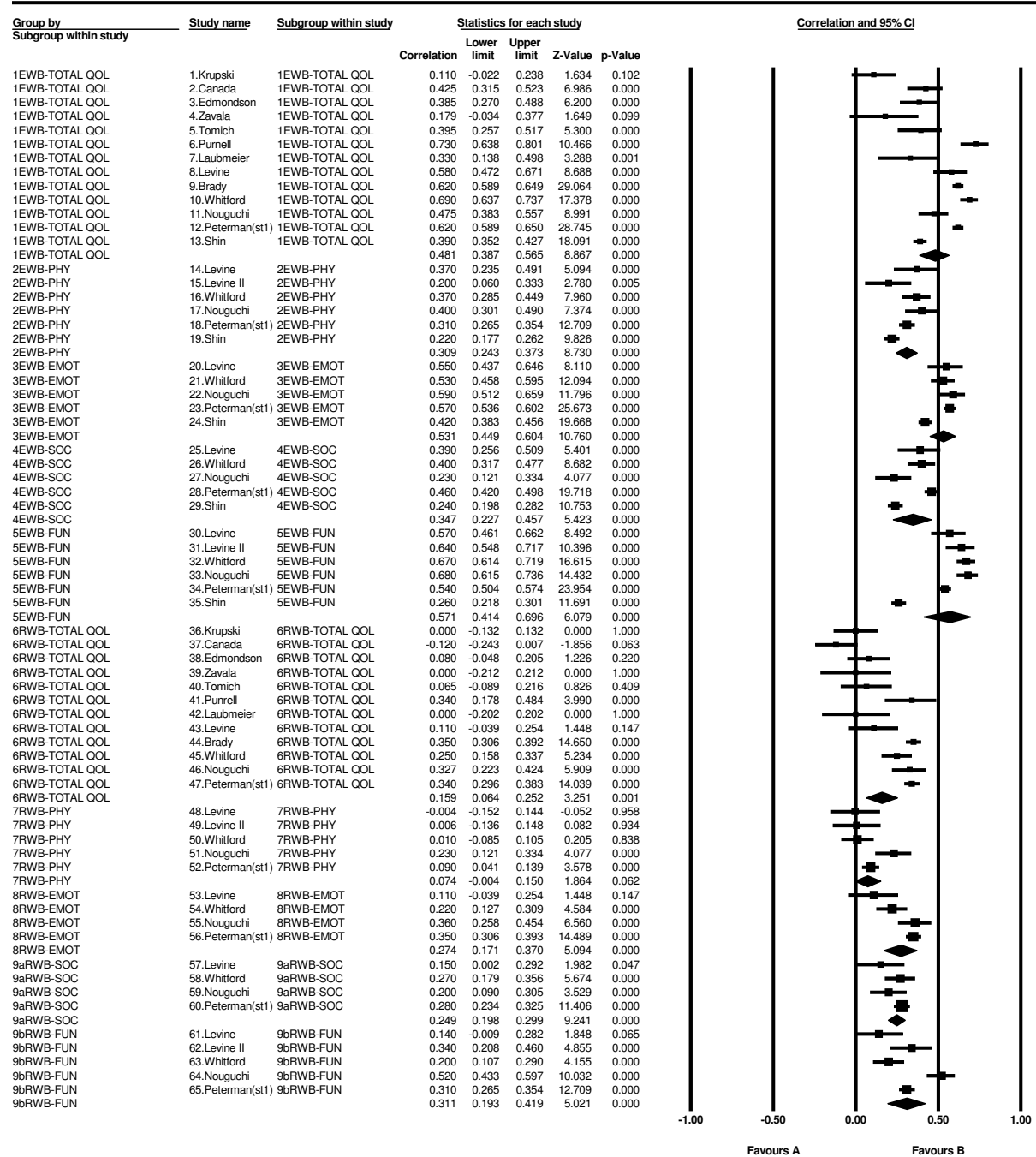


As can be seen from Graph 1, there is a significant relationship (significant effect size) between spirituality - overall score (SWB) and ⁵quality of life and each of its sub-dimensions,

⁵Abbreviations: quality of life (QOL), physical (PHY), emotional (EMOT), social (SOC), functional (FUN)

with stronger effect sizes for the relations spirituality–total quality of life ($r=0.458$, $p=0.0001$), spirituality–functional quality of life ($r=0.508$, $p=0.0001$) and spirituality–emotional quality of life ($r=0.432$, $p=0.0001$). The effect sizes for the relations between spirituality–social quality of life ($r=0.327$, $p=0.0001$) and for spirituality–physical quality of life ($r=0.212$, $p=0.0001$) were weaker but significant.

Graph 2: Spirituality's sub-components (EWB & RWB) with quality of life (QOL) and its sub-dimensions (PHY, EMOT, SOC, FUN)

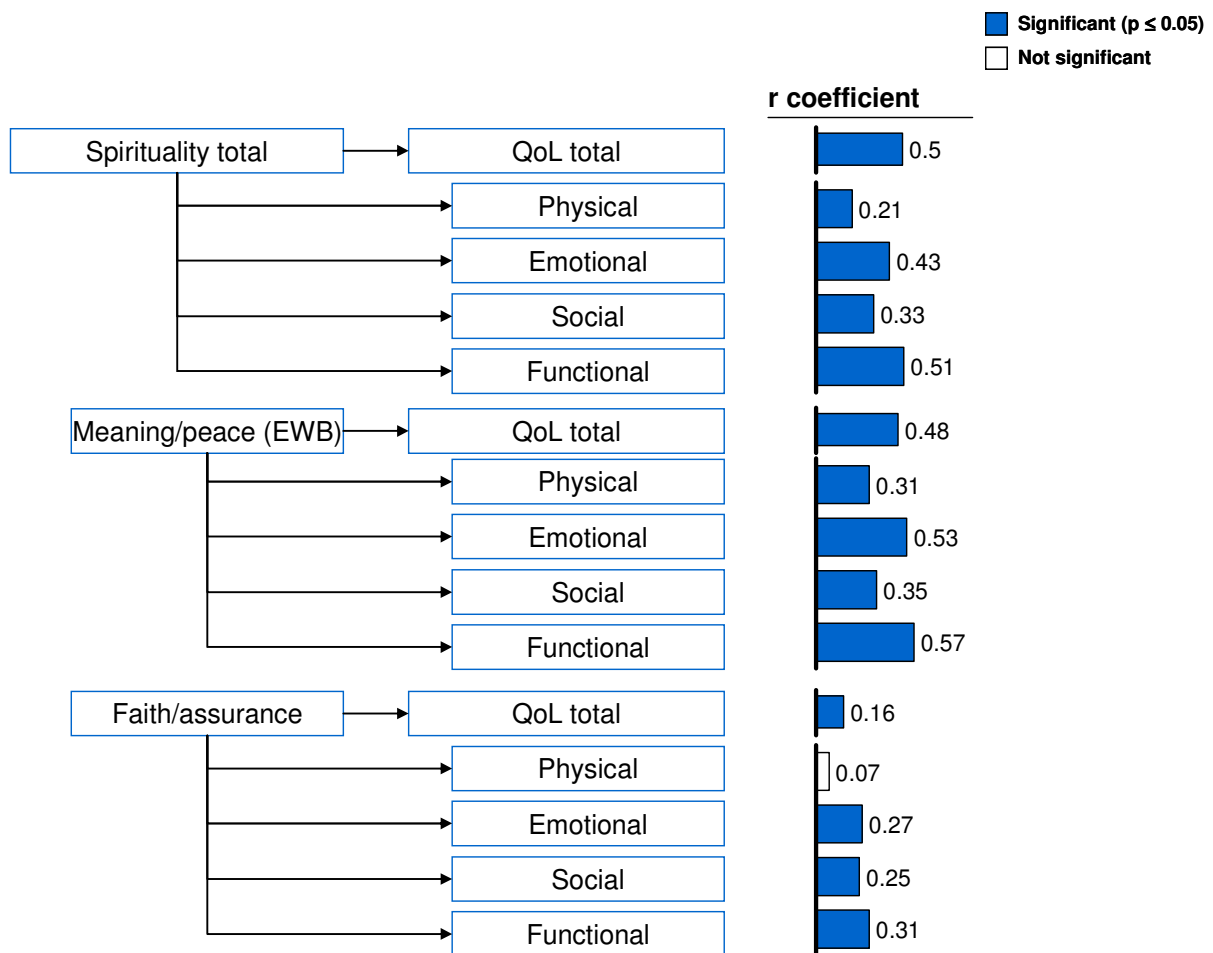


From Graph 2, it can be seen that the meaning component of spirituality (M/P / EWB) contributes more than the faith one (F/A / RWB) to the effect size between spirituality-quality of life, due to the existing stronger effect sizes for the relations meaning-quality of life

($r = 0.481, p=0.0001$) compared to faith-quality of life ($r = 0.159, p=0.001$). The previous observed pattern regarding the relations between the overall score of spirituality (SWB) and QOL (see Graph 1) was maintained also within its sub-types. In other words, also within the meaning and faith components of spirituality (EWB and RWB respectively), stronger relations were found with the functional ($r = 0.571, p=0.0001$; $r=0.311, p=0.0001$ respectively) and the emotional component of quality of life ($r=0.531, p=0.0001$; $r=0.274, p=0.0001$ respectively) in comparison to the social ($r=0.347, p=0.0001$; $r=0.249, p=0.0001$ respectively) and physical ones ($r=0.309, p=0.0001$; $r = 0.074, p=0.06$ respectively).

A summary of the various relationships between spirituality and its sub-dimensions with quality of life and its sub-dimensions is given in Figure 10.

Figure 10: Overview of coefficients between spirituality and quality of life



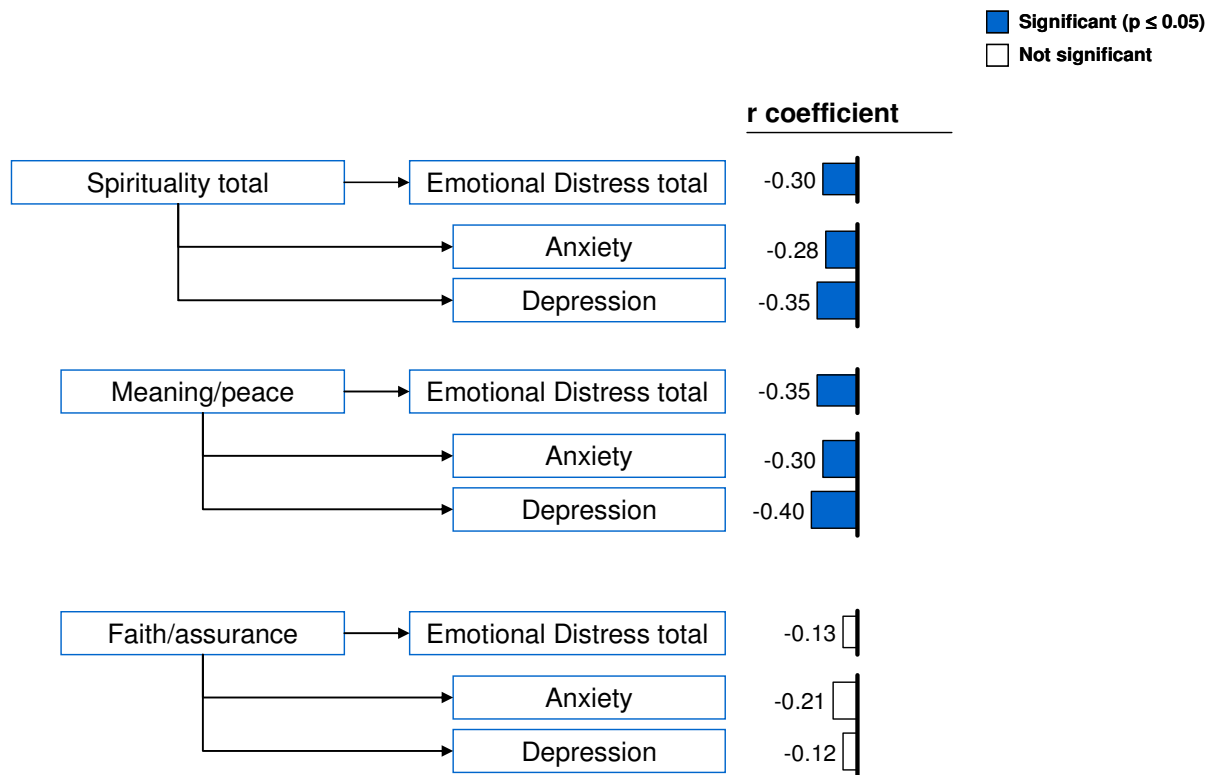
To summarize, Figure 10 shows that spirituality correlates significantly with quality of life and each of its sub-dimensions. Highest correlations can be observed between spirituality and the functional and emotional sub-dimensions of quality of life. As for the meaning and the faith component of spirituality, higher correlations with quality of life and each of its sub-dimensions can be observed within to the meaning component of spirituality in comparison to the faith one.

Graph 3 points to the fact that also from the "negative side of the coin" there are significant relationships between spirituality and emotional distress. As it can be seen, there is a significant negative effect size (correlation) between the overall score of spirituality (SWB) and the total score of⁶ emotional distress ($r=-0.302$, $p=0.023$) as well as with its sub-components, anxiety ($r=-0.278$, $p=0.005$) and depression ($r=-0.349$, $p=0.001$). Stronger effect sizes for spirituality-overall emotional distress and for spirituality-depression in comparison with spirituality-anxiety can be observed (see r and p values above). The same pattern of relations evolved concerning the meaning component of spirituality (EWB), in other words, stronger effect sizes between meaning-overall emotional distress ($r=-0.349$, $p=0.001$) and between meaning-depression ($r=-0.4$, $p=0.001$) in comparison with the effect size between meaning-anxiety ($r=-0.3$, $p=0.025$) can be observed. Regarding the faith component of spirituality (RWB), no significant effects were found between the faith component and the overall score of emotional distress ($r=-0.13$, $p=0.21$) nor with the depression one ($r=-0.116$, $p=0.229$). Weak but significant effects were calculated between the faith component of spirituality and the anxiety component of emotional distress ($r=-0.213$, $p=0.028$), thus again leading to the conclusion that also regarding emotional distress the meaning component of spirituality seems to be the one that contributes the most to the relationships between spirituality and emotional distress.

A summary of the identified relationships between spirituality and emotional distress can be seen in Figure 11.

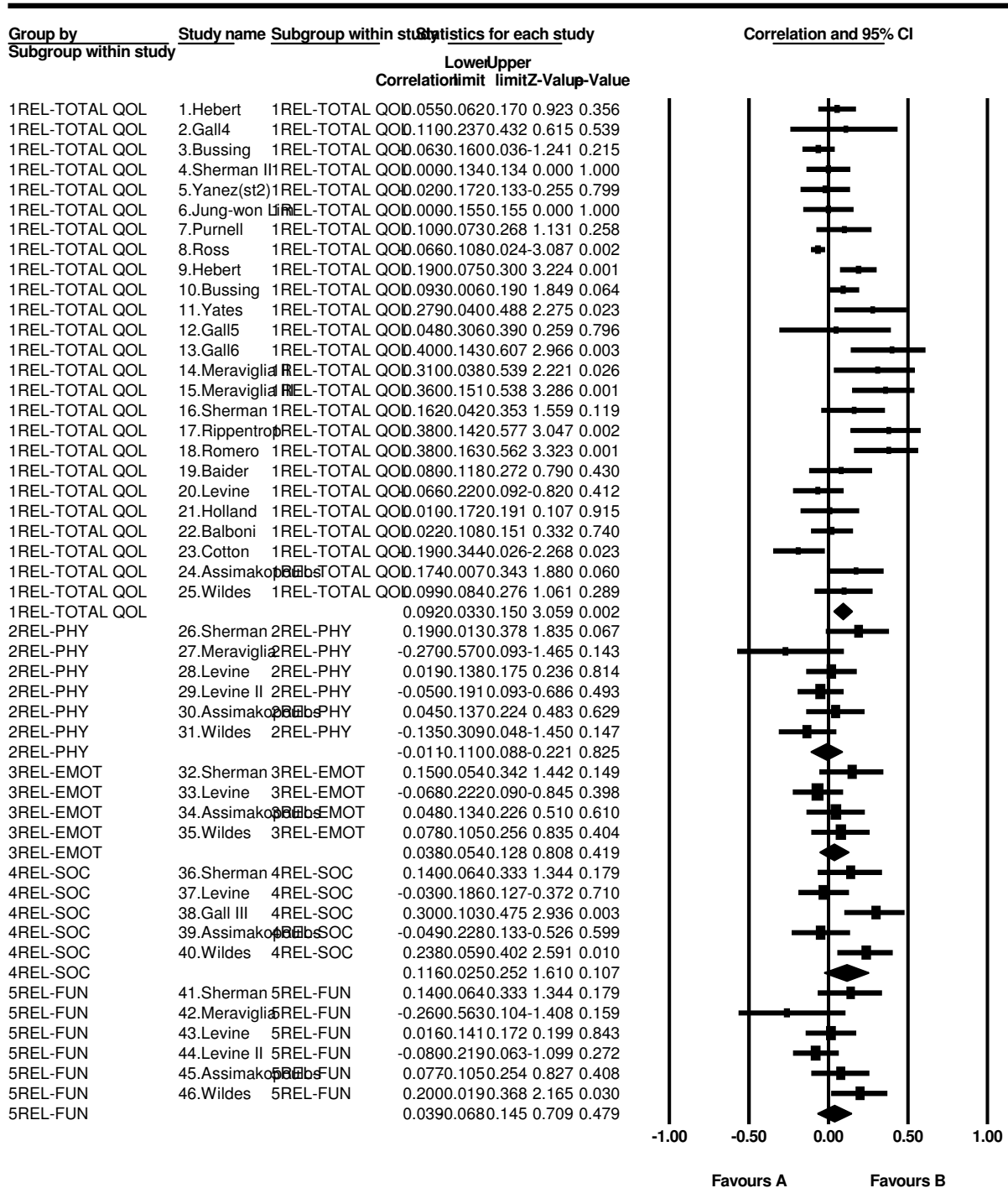
⁶ Abbreviations: overall emotional distress (ED), anxiety (ANX), depression (DEP)

Figure 11: Overview of coefficients between spirituality and emotional distress



To summarize, Figure 11 shows significant negative correlations between spirituality and emotional distress and each of its sub-dimensions. Within the two components of spirituality, only the meaning component of spirituality in comparison to the faith one showed a significant negative correlation with emotional distress and each of its sub-dimensions.

Graph 4: General religiousness (REL) with quality of life (QOL) and its sub-dimensions (PHY, EMOT, SOC, FUN)

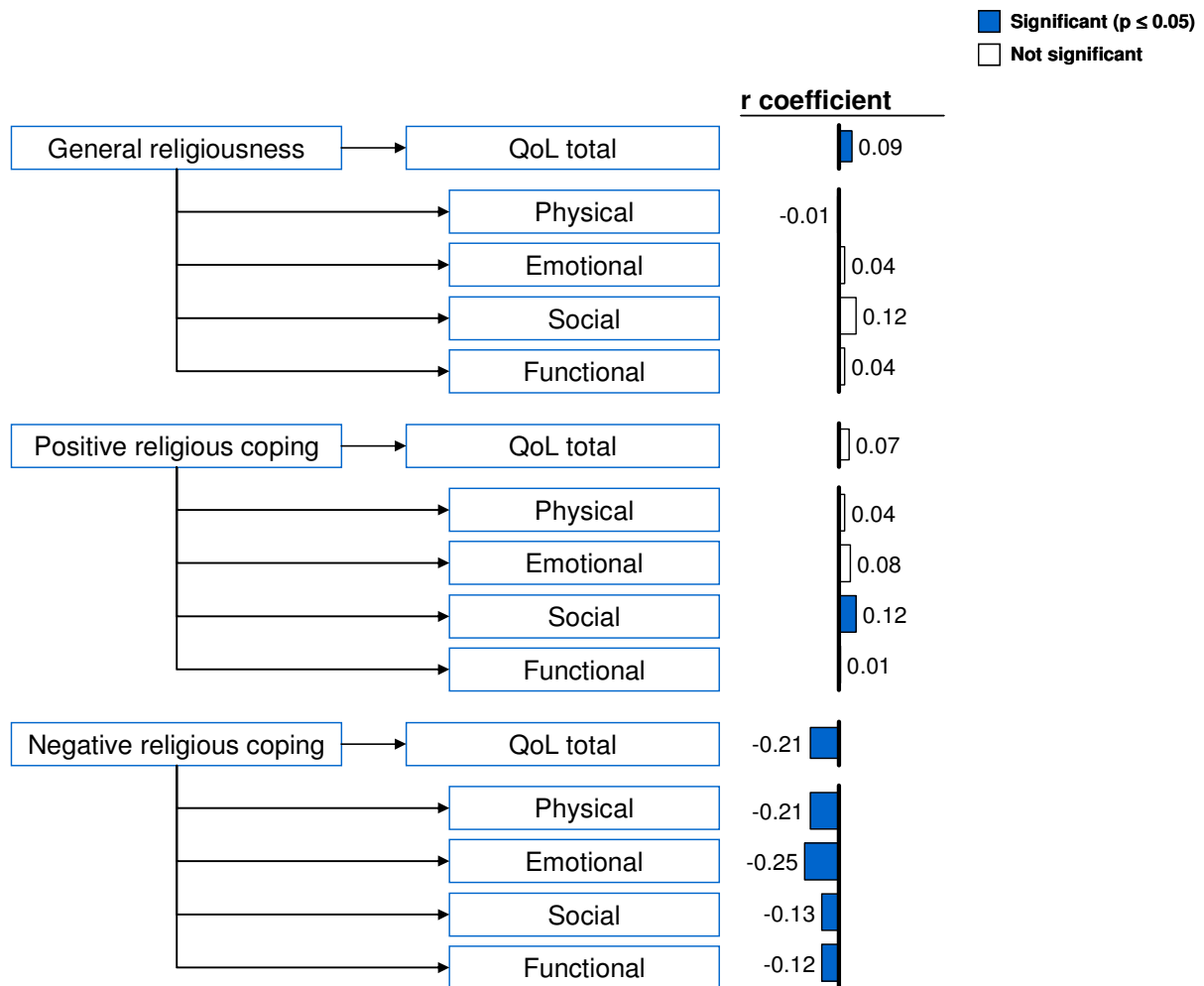


As can be seen from Graph 4, there is a small but significant relationship between general religiousness (REL) and total quality of life ($r=0.092$, $p=0.002$), but no significant associations with the physical dimension of quality of life ($r=-0.011$, $p=0.825$), with the

According to Graph 5, there are neither significant relationships between religious coping positive (RCp) and total quality of life score ($r=0.065$, $p=0.14$), nor between religious coping positive and physical quality of life ($r=0.037$, $p=0.41$), emotional ($r=0.078$, $p=0.22$) or functional quality of life ($r=0.014$, $p=0.878$). Significant relationship between religious coping positive and quality of life were found only concerning the social aspect of quality of life ($r=0.118$, $p=0.007$). In contrast to the positive religious coping variable, the relations between religious coping negative (RCn) and quality of life were significant for the total score of quality of life ($r=-0.205$, $p=0.0001$) as well as for its' sub-dimensions (physical: $r=-0.21$, $p=0.007$; emotional: $r=-0.248$, $p=0.0001$; social: $r=-0.129$, $p=0.042$; functional: $r=-0.12$, $p=0.018$).

A summary of the identified relationships between religion (general religiousness and positive/negative religious coping) and quality of life is depicted in Figure 12.

Figure 12: Overview of coefficients between religion and quality of life

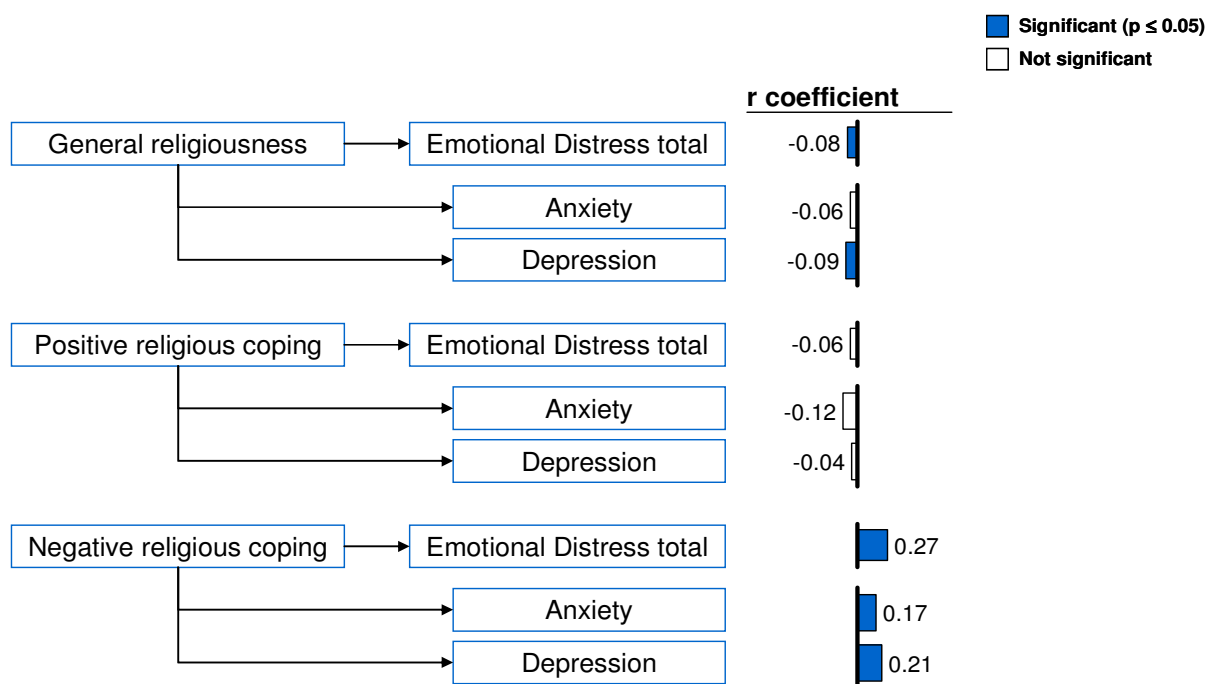


To summarize, Figure 12 shows that general religiousness has a small but significant correlation with total quality of life, a significance that is not maintained once observing the relations between general religiousness and the different sub-dimensions of quality of life. As for religious coping, significant negative correlations were observed between negative religious coping and quality of life and each of its sub-dimensions while positive religious coping significantly correlated only with the social component of quality of life.

coping variable (RCp), no significant relationship could be observed neither with the overall score of emotional distress ($r=-0.057, p=0.26$) nor with its' sub-components-depression ($r=-0.037, p=0.52$) and anxiety ($r=-0.124, p=0.052$) that almost reached significance. As for the negative religious coping variable (RCn), significant relationships could be observed with the overall score of emotional distress ($r=0.266, p=0.002$) as well as with each of its two components: depression ($r=0.205, p=0.01$) and anxiety ($r=0.168, p=0.05$).

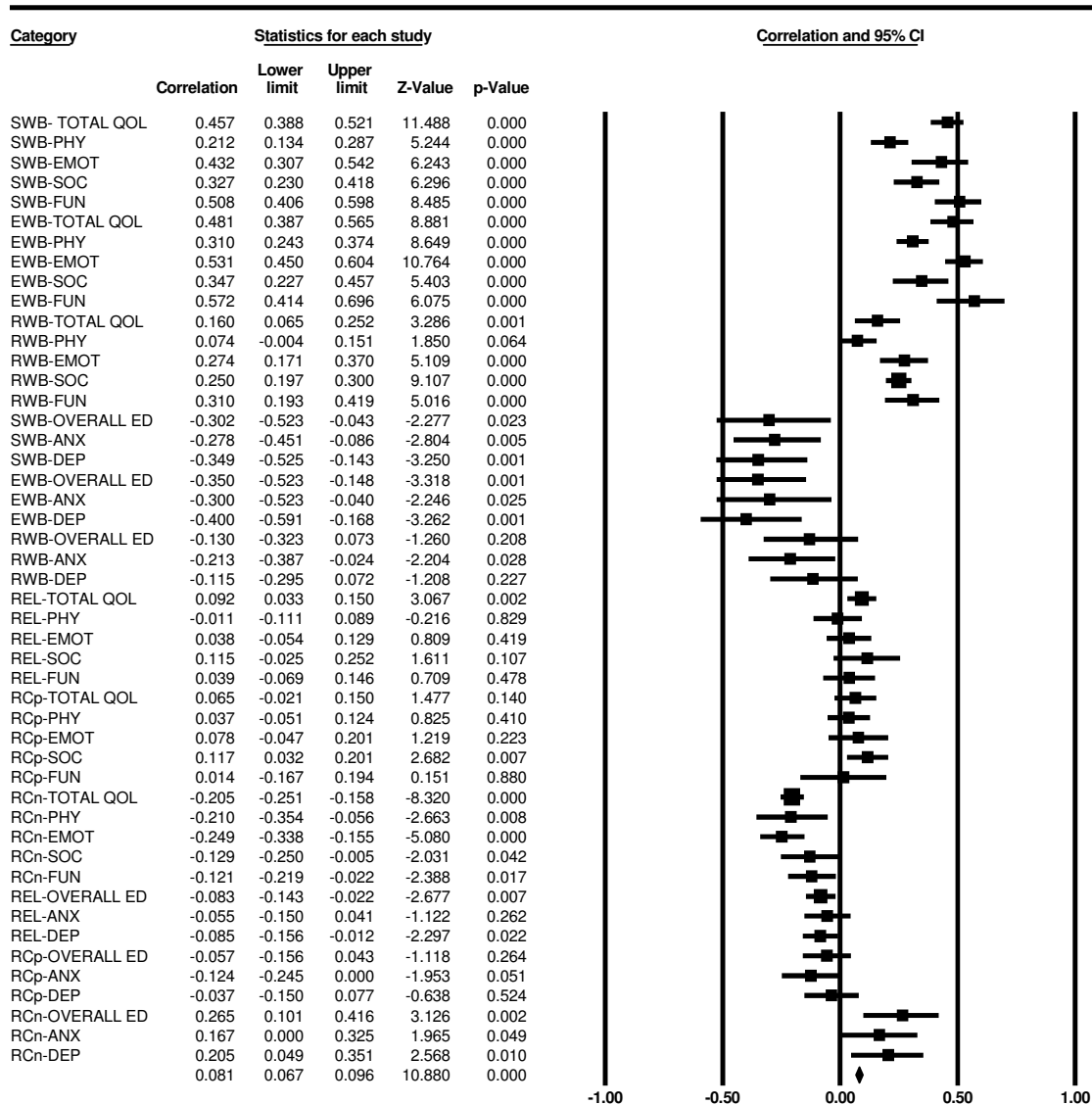
A summary of the identified relationships between religion (general religiousness and positive/negative religious coping) and emotional distress can be seen in Figure 13.

Figure 13: Overview of coefficients between religion and emotional distress



To summarize, Figure 13 shows that general religiousness has a small but significant correlation with emotional distress and its sub-dimension -depression. As for religious coping, only negative religious coping significantly correlates with emotional distress and each of its sub-dimensions while positive religious coping does not. The effect sizes for each of the above-mentioned categories are summarized in Graph 7.

Graph 7: Summary of effect sizes for each of the independent-dependent variables' Combinations



To conclude, it can be seen from Graph 7 that there are stronger positive correlations between spirituality and quality of life and stronger negative correlations between spirituality and emotional distress in comparison with the existing correlations between religion and each of those dependent variables. Within spirituality, stronger correlations with quality of life and emotional distress can be observed with the meaning component of spirituality in comparison to the faith one (see in Graph 7 effect sizes for EWB vs. effect sizes for RWB). Among religion, negative religious coping strategies show stronger correlations with the mentioned

dependent variables in comparison to positive religious coping strategies and to general religiousness.

In addition to the mentioned above analyses, further analyses were done in order to search for existing publication bias and in order to estimate its magnitude, in other words the number of additional 'negative' studies (studies in which the intervention effect was zero) that would be needed to increase the p value for the meta-analysis to above 0.05 and therefore disprove the results of the analysis for those categories in which the computed effect size was found to be significant. Publication bias was found only regarding the studies analyzed under the category of 'religious coping positive–social quality of life' (Fail-safe N= 0), implying that further research concerning this category is needed. For additional information about the different computed values of the Fail safe N for each of the analyzed categories please refer to 'Fail safe N values' in the appendix.

To summarize the results of the analysis on research question one, the following can be concluded. First, there are consistent positive relationships between spirituality and quality of life (and most of their sub-dimensions). Similarly, there are consistently negative relationships between spirituality overall and its meaning component and emotional distress. Second, only a weak positive relationship between general religiousness and quality of life could be found, which was not confirmed when analyzing the sub-dimensions. Moreover, while there is no significant relationship between positive religious coping and quality of life, a significantly negative relationship between negative religious coping and quality of life was found. Third, this same pattern applies (in reverse, i.e. positive coefficients turn negative) to the relationships between religion and emotional distress.

3.3. Results Research Question 2

The second research question focuses on trying to understand whether there are any moderating effects by demographic and illness variables (e.g. gender and cancer type respectively) on the observed effect sizes as computed in the first research question. The illness and demographic variables that were checked as potential moderators were: gender (men vs. women), age, education (high school education vs. high education), cancer type (breast cancer, prostate cancer and other types of cancer), cancer stage (early⁷ vs. advanced) and time since diagnosis (in months). Marital status and ethnicity as moderating variables were not analyzed due to lack of variance (e.g. reported marital status was almost always only 'married') or due to many missing values. Moderating influences of the mentioned above variables were tested for the following categories: Spirituality (and each of its' sub-dimensions) with overall score of quality of life and emotional distress. Religiosity and religious coping (in its positive and negative form) with overall score of quality of life and emotional distress.

In order to address the second research question, a Q test was computed (Altman, 2003), a test checking the heterogeneity between the computed effect sizes for different sub-groups of categorical variables (e.g. between the effect size computed for men and the effect size computed for women under a specific category, such as 'meaning-total quality of life'), while for continuous variables, such as age and time since diagnosis, a regression model was computed in order to check whether the influence of those variables on the observed effect sizes is significant.

⁷ Stages 0-2 are included under the category of 'early stage' while stage 3-4 and terminal stage under the category of 'advanced stage'. For additional information about the exact coding for each of illness and demographic variables mentioned above please refer to ' manual code' in the appendix.

The results of the significant moderating effects of illness and demographic variables for the relationships of spirituality (and its sub-dimensions) with quality of life / emotional distress is given in Figure 14.

Figure 14: Moderating effects of variables between spirituality and QoL and ED

		Moderating effects of variables on r-coefficients, 95% confidence interval					
		Total Quality of Life and...			Emotional Distress and...		
		Spirituality	Meaning	Faith	Spirituality	Meaning	Faith
Patient	Gender	-	-	-	-	Male: 0.16 Female:-0.44	-
	Age (delta in r per year of age)	-	+0.015	+0.011	+0.035	+0.025	-0.018
	Education	n/r: 0.58 H/S: 0.41 Higher: 0.39	n/r: 0.60 Higher: 0.48 H/S: 0.38	n/r: 0.31 H/S: 0.16 Higher: 0.08	-	-	-
Illness	Cancer type	-	BC: 0.51 PC: 0.11 Div.: -0.55	Div.: 0.26 BC: 0.10 PC: 0.00	BC: -0.43 Div.: -0.21 PC: -0.11	Div.: -0.43 BC: -0.41 PC: -0.11	-
	Cancer stage	n/r: 0.53 Adv.: 0.33 Early: 0.32	n/r: 0.55 Early: 0.44 Adv.: 0.18	-	-	-	-
	Time since diagnosis (delta in r per month)	+0.002	+0.004	-0.004	-	-0.003	+0.004

The results shown in Figure 14 can be summarized as following:

- 1) For the category of overall spirituality-quality of life (*SWB-TOTAL QOL*) no moderating effects on the computed effect sizes were found for gender ($Q=0.103, p=0.749$) or for type of cancer ($Q=7.25, p=0.123$), in contrast to the significant moderating effect found for education ($Q=20.266, p=0$) and cancer stage ($Q=16.88, p=0$). Age was found to be a non significant moderator (slope=-0.003, $p=0.308$) in contrast to the variable time since diagnosis (slope=-0.002, $p=0.0003$). For the moderator variable 'education' there were higher effect sizes for studies in which the majority of the subjects had a higher education compared to those with a high school education ($r=0.407$ vs. $r=0.394$ respectively), while the highest effect sizes were found in those studies that did not

report on the level of education at all ($r=0.579$). For the moderator variable 'cancer stage' slightly higher effect sizes were found for those studies in which the majority of the subjects had cancer in an advanced stage in comparison to those with an early one ($r=0.327$ vs. $r=0.321$ respectively) while the highest effect sizes found were in those studies that did not report on the cancer stage at all ($r=0.530$). For the moderator variable 'time since diagnosis', for every month that goes by, the effect size significantly weakens by 0.002.

- 2) For the category of meaning-quality of life (*EWB-TOTAL QOL*) no moderating effects on the computed effect sizes were found for gender ($Q=0.592$, $p=0.442$) in contrast to education ($Q=11.09$, $p=0.004$), cancer stage ($Q=13.15$, $p=0.001$) and cancer type ($Q=40.376$, $p=0$). Age was found to be a moderating variable (slope= 0.015, $p=0$) as well as time since diagnosis (slope= -0.00391, $p=0$). For the moderating variable 'education' higher effect sizes were found in studies in which the majority of the subjects had a higher education ($r=0.484$) in comparison to those studies in which the majority of the subjects had a high school education ($r=0.378$). Highest effect sizes were observed in those studies not reporting on level of education at all ($r=0.6$). Regarding the moderator 'cancer stage', higher effect sizes could be observed in studies done on subjects with an early stage of cancer ($r=0.443$) in comparison to an advanced one ($r=0.179$). Highest effect sizes were observed in those studies not reporting on cancer stage at all ($r=0.553$). For the moderating variable 'cancer type', higher effect sizes were observed in those studies done on subjects suffering from breast cancer ($r=0.512$) and on subjects with diverse types of cancer ($r=-0.548$) in comparison to those done on subjects having prostate cancer ($r=0.11$) and to those studies not reporting on the type of cancer at all ($r=0.17$). For the moderator 'age', with the progression in age, the effect size grows by

- 0.015. For the moderator 'time since diagnosis', the effect size weakens by 0.0039 for every month that goes by since the diagnosis was first given,
- 3) For the category of faith-quality of life (*RWB-TOTAL QOL*) no moderating effects on the computed effect sizes were found for gender ($Q=0$, $p=0.9$) and cancer stage ($Q=3.79$, $p=0.15$) in contrast to education ($Q=6.94$, $p=0.031$) and cancer type ($Q=13.62$, $p=0.003$). Age and time since diagnosis were also found to be significant moderating variables (slope= 0.011, $p=0.0006$; slope=-0.0039, $p=0$ respectively). For the moderating variable 'education', higher effect sizes could be observed in those studies done on subjects with a high school education ($r=0.163$) in comparison to those done on subjects with a higher education ($r=0.08$). Highest effect sizes under 'education' were found for those studies not reporting on level of education at all ($r=0.308$). For the moderator 'cancer type', higher effect sizes could be found in studies done on subjects with diverse type of cancer ($r=0.256$) in comparison to studies done on subjects with breast cancer ($r=0.096$), studies done on subjects with prostate cancer ($r=0$) and studies not reporting on cancer type at all ($r=0$). For the moderating variable 'age', for every additional year the effect size grows by 0.011. For the moderator 'time since diagnosis', for every month that goes by since the diagnosis was first given, the effect size weakens by 0.0039.
- 4) For the category of overall spirituality–emotional distress (*SWB-OVERALL ED*) no moderating effects were found for gender ($Q=3.32$, $p=0.068$), education ($Q=1.79$, $p=0.407$) and cancer stage ($Q=0.417$, $p=0.81$) in contrast to cancer type ($Q=10.8$, $p=0.04$). Age was also found to be a moderating variable (slope= 0.035, $p=0$) in contrast to time since diagnosis (slope=-0.00019, $p=0.79$). For the moderating variable 'cancer type', higher negative effect sizes could be observed for breast cancer ($r=-0.429$) in comparison to prostate cancer ($r=-0.11$) and to studies reporting on diverse types of

cancer ($r=-0.205$). For the moderating variable 'age', the effect size weakens by 0.035 (less negative effect sizes) with the progression in age.

- 5) For the category of meaning-emotional distress (*EWB-OVERALL ED*) moderating effects were found for gender ($Q=5.036$, $p=0.025$) and type of cancer ($Q=21.21$, $p=0$) in contrast to education ($Q=1.13$, $p=0.56$) and cancer stage ($Q=0.162$, $p=0.92$). Both age and time since diagnosis were found to be significant moderating variables (slope=0.025, $p=0$; slope=-0.003, $p=0$ respectively). Regarding the moderating variable 'gender', stronger effect sizes could be observed for women ($r=-0.436$) in comparison to men ($r=0.156$). For the moderating variable 'type of cancer', stronger effect sizes were found in studies done on subjects with breast cancer ($r=-0.409$) and in studies done on subjects with diverse types of cancer (-0.428) in comparison to studies done on subjects with prostate cancer ($r=-0.11$) or lung cancer ($r=0.28$). For the moderator 'age', progression in age weakens the effect size by 0.025 (less negative effect sizes). For 'time since diagnosis', with every month that goes by since the diagnosis was first given, the effect size increases by 0.003 (more negative effect sizes).
- 6) For the category of faith-emotional distress (*RWB-OVERALL ED*) no moderating effects were found for gender ($Q=2.99$, $p=0.084$), education ($Q=1.079$, $p=0.583$), cancer stage ($Q=1.011$, $p=0.603$) and cancer type ($Q=2.88$, $p=0.237$). Age and time since diagnosis were both found to be significant moderators (slope= 0.0179, $p=0$; slope= 0.004, $p=0$ respectively). In other words, the older you get the weaker the effect size is, by 0.0179 (less negative effect size). Additionally, the more time goes by since the diagnosis was first given the weaker the effect size is by 0.0043 (less negative effect size).

The results of the significant moderating effects of illness and demographic variables on the relationship between religion and quality of life / emotional distress are presented in Figure 15.

Figure 15: Moderating effects of variables between religion and QoL and ED

		Total Quality of Life and...			Emotional Distress and...		
		General religiousness	Positive rel. coping	Negative rel. coping	General religiousness	Positive rel. coping	Negative rel. coping
Patient	Gender	-	-	-	-	Female: -0.16 Male: 0.08	-
	Age (delta in r per year of age)	-0.008	-0.019	-	-0.013	-	+0.038
	Education	n/r: 0.29 H/S: 0.07 Higher: 0.06	-	-	-	-	H/S: 0.32 Higher: 0.31 n/r: -0.28
Illness	Cancer type	-	-	-	-	BC: -0.16 GC: -0.14 Div.: 0.08	GC: -0.28 Div.: 0.36 BC: 0.28
	Cancer stage	-	-	-	-	Early: -0.16 n/r: -0.01 Adv.: 0.05	-
	Time since diagnosis (delta in r per month)	-	-	-	+0.001	-	-

n/r = not reported PC = prostate cancer
H/S = high school GC = gynecol. cancer
BC = breast cancer Div. = diverse

The results shown in Figure 15 can be summarized as following:

- 1) For the category of general religiousness-quality of life (*REL-TOTAL QOL*), no moderating effects were observed for gender ($Q=0.086, p=0.769$), cancer stage ($Q=0.771, p=0.68$) and cancer type ($Q=4.56, p=0.47$) in contrast to education ($Q=10.09, p=0.006$) and age (slope=-0.0084, $p=0.01$). Time since diagnosis was not found to be a significant moderator (slope=-0.00045, $p=0.21$). For the moderating variable 'education', higher effect sizes could be observed in studies done on subjects with high school education ($r=0.071$) in comparison to those with subjects with higher education ($r=0.058$). The highest effect sizes were found for those studies not reporting on

- educational level at all ($r=0.292$). Regarding the moderating variable 'age', progression in age, weakens the effect size by 0.0084.
- 2) Regarding the category of religious coping positive and quality of life (*RCp-TOTAL QOL*), no moderating effects were found to gender ($Q=1.36$, $p=0.24$), education ($Q=4.11$, $p=0.128$), cancer stage ($Q=0.245$, $p=0.88$), cancer type ($Q=5.63$, $p=0.228$) and time since diagnosis (slope= 0.0004 , $p=0.79$). Age was the only significant moderator under this category (slope = -0.019 , $p=0.0003$), meaning that with each year that goes by the effect size weakens by 0.019.
 - 3) For the category religious coping negative–quality of life (*RCn-TOTAL QOL*), no moderating effects were found for gender ($Q=0.877$, $p=0.349$), education ($Q=2.06$, $p=0.3$), cancer stage ($Q=2.25$, $p=0.32$), cancer type ($Q=6.4$, $p=0.17$), time since diagnosis (slope= -0.001 , $p=0.34$) and age (slope= 0.0068 , $p=0.1$).
 - 4) For the category of general religiousness-emotional distress (*REL-ED*), no moderating effects were found for gender ($Q=3.67$, $p=0.055$), education ($Q=1.11$, $p=0.57$), cancer stage ($Q=2.004$, $p=0.367$) and cancer type ($Q=1.76$, $p=0.623$) in contrast to age and time since diagnosis that were found to be significant moderating variables (slope= 0.013 , $p=0.004$; slope= 0.0012 , $p=0.01$ respectively). For the moderating variable 'age', progression in age weakens the effect sizes by 0.013 (less negative effect size). For 'time since diagnosis', with every month that goes by since the diagnosis was first given, the effect size weakens by 0.0012 (less negative effect).
 - 5) For the category religious coping positive-overall emotional distress (*RCp- ED*), significant moderators found were gender ($Q=9.7$, $p=0.002$), cancer stage ($Q=7.6$, $p=0.022$) and cancer type ($Q=9.921$, $p=0.018$). Education ($Q=0.7$, $p=0.7$), age (slope = 0.02 , $p=0.09$) and time since diagnosis (slope= -0.005 , $p=0.41$) were not found to be significant moderating variables. For the moderating variable 'gender' stronger effect

sizes were found for women ($r=-0.156$) in comparison to men ($r=0.077$). For the moderator 'cancer stage', stronger effect sizes were found in studies done on subjects with an early cancer stage ($r=-0.155$) in comparison to those done on subjects with an advanced cancer stage ($r=0.054$) and to those studies not reporting on the cancer stage at all (-0.007). For the moderating variable 'cancer type', stronger effect sizes were found for breast cancer ($r=-0.16$) in comparison to gynecological cancer ($r=-0.14$), diverse types of cancer ($r=0.084$) and to those studies not reporting on type of cancer at all ($r=0$).

- 6) For the category of negative religious coping–emotional distress (*RCn-ED*), no moderating effects were found for gender ($Q=1.3$, $p=0.25$), cancer stage ($Q=3.31$, $p=0.19$) and time since diagnosis (slope= 0.0017 , $p=0.46$) in contrast to education ($Q=32.4$, $p=0$), cancer type ($Q=34$, $p=0$) and age (slope= 0.038 , $p=0.001$). For the moderating variable 'cancer type', stronger effect sizes were observed in studies done on subjects with diverse types of cancer ($r=0.359$) and in studies not reporting on the type of cancer at all ($r=0.41$) in comparison to those done on subjects with breast cancer ($r=0.277$) or gynecological cancer ($r=-0.279$). For the moderator 'education', higher effect sizes could be observed for studies done on subjects with high school education ($r=0.324$) in comparison to higher education (0.31) and to studies not stating on educational level at all ($r=-0.279$). For the moderator 'age', progression in age increases the effect size by 0.038 (more positive effect sizes).

Graphs of the results mentioned above can be found under 'graphs-second research question' in the appendix.

To summarize: *education* was found to be a moderating variable for the spirituality-quality of life connections, with higher effect sizes for subject with a high education under the categories of overall spirituality-total quality of life (SWB-QOL) and meaning-total quality of life (EWB-QOL) in comparison to higher effect sizes for subjects with a high school education under the category of faith-total quality of life (RWB-QOL).

Time since diagnosis was found to be a moderating variable for the spirituality-quality of life connections (longer time since diagnosis resulting in lower effect sizes under all the three categories: overall spirituality-total quality of life (SWB-QOL), meaning-total quality of life (EWB-QOL) and faith-total quality of life (RWB-QOL) and for the spirituality-emotional distress connections (longer time since diagnosis resulting in lower effect sizes for faith-overall emotional distress (RWB-ED) but in higher effect sizes for meaning-overall emotional distress (EWB-ED). Time since diagnosis was found to be moderating also the relations between general religiousness (REL) and emotional distress (ED) with longer time since diagnosis also resulting in weaker effect sizes.

Age was found to be a moderating variable for the spirituality-quality of life connections, specifically, progression in age results in higher effect sizes for both meaning-total quality of life (EWB-QOL) and faith-total quality of life (RWB-QOL) connections. For the relations spirituality-emotional distress, the moderating effects of age seem to affect toward the opposite direction, in other words, progression in age results in smaller effect sizes (less negative) under the categories of spirituality-emotional distress. Age was found to be moderating also the connections between religiousness-quality of life, religious coping positive-quality of life and religiousness-emotional distress, with growing age resulting in weaker effect sizes for those categories in contrast to a higher effect size under the category of religious coping negative-emotional distress.

Type of cancer was found to be moderating spirituality–quality of life relations (meaning-quality of life, faith-quality of life) and spirituality-emotional distress relations (overall spirituality-emotional distress, meaning-emotional distress) with higher effect sizes for those studies reporting on subjects with breast cancer and diverse types of cancer. Type of cancer also moderates the connections between religious coping positive–emotional distress and religious coping negative-emotional distress also with higher effect sizes for studies reporting on subjects with breast cancer and diverse types of cancer respectively.

Stage of cancer was a moderator for spirituality-quality of life connections (overall spirituality-quality of life: higher effect sizes for advanced stage, meaning-quality of life: higher effect sizes for early stage) and for religious coping positive–emotional distress connection (higher effect sizes for early stage).

Gender moderates only the connections between meaning-emotional distress (EWB-ED) and religious coping positive-emotional distress (RCp-ED) with higher effect sizes in favor of women.

4. Discussion

Cancer is an establishing event in the life of a patient suffering from the disease. Coping with cancer is therefore not an easy task. Coping with cancer disease is a massive and intensive process in which the patient has to deal with the several physical consequences of the disease as well as with the accompanying feelings aroused by the disease (Block, 2006).

Religion and spirituality were found to be often used in coping with stressful life experiences. It seems to be that religion takes on an especially prominent role in coping in comparison to other coping strategies since concepts like 'meaning', 'God', 'transcendence' and others are involved within the process (Pargament, 2002), concepts that become relevant in extreme life situations such as cancer since the experience of the cancer patient after receiving the diagnosis is constituted from little non sequential "shocks" that provoke the instinct to bring things under some sort of order and control (Murray and Chamberlain, 1999). This need for order and control is mostly felt once dealing with a life threatening situation, since human's basic fear of death is aroused, therefore bringing the patient to the need to deny this death in one way or another (Becker, 1973; Bauman, 1992) and to create meaning from suffering also in situations that seem to go beyond the person's coping abilities (Frankel, 1992).

Yet, for some people and some problems religion and spirituality seem to be relatively uninvolved, remaining more a part of the background than the foreground of coping. Therefore, in this paper the results of a meta-analysis about religion and spirituality as coping mechanisms for cancer patients were presented in order to better understand the role of religion and spirituality in coping with cancer. Specifically, the interest of this research work was to understand which forms of religion and spirituality can be seen as beneficial for cancer patients' psycho-social well-being and to whom (in term of illness and demographic variables)

those beneficial influences apply. A meta-analysis of 62 relevant studies was conducted in order to quantitatively examine the relationships between religion / spirituality and cancer patient's well being. A meta-analysis was chosen as the research methodology in this study since a meta-analysis allows drawing conclusions regarding a specific research question from a large body of research using a powerful quantitative statistical analysis. A meta-analysis as a research method has several advantages but also disadvantages. The advantages in conducting a meta-analysis is mainly the fact that it enables to summarize and review in a systematic and quantitative way different primary comparable studies, combining all the research existed on one topic into one large study. A meta-analysis also enables to highlight correlations and links between studies that may not be otherwise apparent as well as ensuring that the stated correlations in fact exist. Potential disadvantages however also exist, such as the danger in aggregating a set of different studies, making it difficult to interpret the results meaningfully (heterogeneity problem) as well as the danger of not including un-published studies also when relevant (publication bias). However, the mentioned above disadvantages are partly amendable through the estimation of the publication bias and through the use of a specific analysis model (random effect model) that takes into account a potential existing heterogeneity (Marks & Yardley, 2004). Within this meta-analysis, the heterogeneity and the publication bias problems were taken into account. An additional disadvantage in meta-analysis as a research methodology is that no new knowledge is being created, since the scope of a meta-analysis is to arrange and draw conclusions from existing empirical analysis done on a specific field of research and not to create a new knowledge in the field.

An additional discussion point concerning the methodology part, should refer to the assessment tools used to date within the research field of religion and spirituality as could be observed from each of the 62 studies collected for this meta-analysis. On the positive side, the assessment tools to assess religion and spirituality to date show mostly a high internal

reliability (alpha Cronbach of 0.7 or higher). However, limitations regarding the existing assessment tools used to measure religion and spirituality do exist:

Concerning religiousness, many studies used questionnaires assessing one single dimension of religion (e.g. religious practice, or religious faith) although religion is multidimensional, with each dimension potentially linking in a different way to emotional distress and quality of life. General religiousness needs therefore further exploration using appropriate instruments in which all of the different sub-dimensions of religiousness are included in one assessment tool, taking into account at the same time the different sub-types of religion and their unique connection with the mentioned above dependent variables. As for religious coping, assessment tools used to measure religious coping in comparison to those used to measure different aspects of general religiousness, seem to provide more accurate information regarding the relations between religion and psycho-social well being. Tools used in order to measure religious coping provide more specific clusters of items, referring to the specific way in which the patient uses those coping strategies once dealing with stress. The main assessment tool existing to date in order to measure religious coping is the RCOPE, clearly dividing the clusters of items to positive and negative strategies. However, the weakness of this questionnaire is that the mentioned above division makes a priori assumption of which religious coping strategies are adaptive and which are maladaptive rather than treating it as an empirical question. As a consequence, it might be necessary in the future to develop an additional assessment tool for specific religious coping strategies without aggregate it to positive or negative strategies in advance. As for spirituality, the most representative measure of spirituality is the FACIT-SP, an assessment tool that was shown to be good (higher internal reliability, higher availability in different languages etc.) and it is considered as a popular measure of spirituality among cancer patients. However, it seems that the 12 items used in the FACIT-SP questionnaire measure something beyond their respective factors (meaning/ peace

and faith/ assurance) (Canada et al., 2008), thus suggesting that future research could focus on creating additional assessment tools for spirituality, and mainly for its meaning sub-component, for which existing assessment tools are scarce. Last, since existing measurements of religion and spirituality do not refer to a specific culture, to a specific cancer type or stage, future assessment tools could be created for specific sub-types of cancer patients and for specific segments of the cancer populations.

As for the results part and its first research question: "which forms of religion and spirituality are overall beneficial for cancers patients' psycho-social well-being?" results show that spirituality highly correlates with overall quality of life ($r=0.457$, $p=0.0001$), especially with the functional aspect of quality of life ($r=0.508$, $p=0.0001$) and with the emotional one ($r=0.432$, $p=0.0001$). One possible explanation for that could be that spirituality unlike religion is less of an activity in the public domain or a social practice but more a concern of human beings with their own depths and transpersonal activities (Carr, 2000), therefore correlating less with the social aspect of quality of life in comparison to the emotional and functional ones. Additionally, since cancer creates many changes in the patient's interpersonal relationships (following social stigmatization, social isolation, etc.) and in his own perceived social identity (Little et al., 1998), the perceived social well-being (as expressed in self reported measures of quality of life questionnaires) can be influenced, in turn also influencing spirituality- social quality of life correlations. As for the relatively lower correlations between spirituality and the physical aspects of quality of life, a potential explanation for those correlations could be the special physical challenges that the disease and its treatments impose (Block, 2006), thus potentially blocking the ability to perceive positive changes within the physical condition also when existing. Within spirituality, higher correlations with quality of life were found among the meaning component of spirituality ($r=0.481$, $p=0.0001$) in comparison to the faith one ($r=0.160$, $p=0.001$), implying that the individual's ability to make

sense of difficult life circumstances through finding meaning and purpose has more impact on psychological well-being than having a spiritual belief system (McCoubrie & Davis, 2006). One potential explanation could be the tendency to question the faith following an illness (Zwingmann et al., 2006) and the need to re-define the meaning of the present existing belief system following this illness (Pargament, Smith, Koenig & Perez., 1998). At the same time, finding a sense of meaning in life, a belief that life has a purpose, that life is a gift seems to be extremely important for cancer patients' need for restitution after the break that the disease creates in the sense of self, continuity and coherence in life (Bingley et al., 2006). The pattern of higher correlations of overall spirituality with the emotional and functional aspects of quality of life was maintained also within the meaning ($r=0.531$, $p=0.0001$; $r=0.572$, $p=0.0001$ respectively) and the faith component of spirituality ($r=0.274$, $p=0.0001$; 0.310 , $p=0.0001$ respectively).

As for the relations between spirituality and emotional distress, significant negative correlations were found between spirituality and overall emotional distress ($r=-0.302$, $p=0.023$) implying that the higher the spirituality, the lower the emotional distress of the patient and vice versa, with higher negative correlations with the depression component of emotional distress ($r=-0.349$, $p=0.001$) in comparison to the anxiety one ($r=-0.278$, $p=0.005$). These results could be attributed to the different underlying dysfunctional cognitions of persons suffering from anxiety in comparison to those suffering from depression, despite their clinical similarities and co-morbidity. Specifically, depressed individuals have cognitions containing themes of personal worthless, incompetence, failure etc. whereas the cognitions of anxious individuals focuses on themes like threat, danger, unpredictability and uncertainty (Greenberg & Beck, 1989), cognitions that might be more resistant to the buffering effects of spirituality in comparison to the cognitions underlying depression.

As for religion, general religiousness showed a small but significant positive correlation with the overall score of quality of life ($r=0.092$, $p=0.002$) in comparison to religious coping in its negative form ($r=-0.205$, $p=0.0001$) that showed stronger correlations with quality of life (positive religious coping did not correlate with quality of life). A potential explanation for the weaker correlations between general religiousness and quality of life in comparison to those between negative religious coping and quality of life could be that examining religion in relation to adjustment to stress from a more general perspective (church attendance, religious importance etc.) oversimplifies the construct of religion, whereas religious coping takes into account the *specific* religious activities that people employ in times of stress, which says more about the religion-health connections (Ano & Vasconcelles, 2005). Those religious coping–quality of life connections might indicate that religious coping serves a variety of purposes in day to day living and in crisis such as offering: a framework for understanding and interpreting difficult life experiences, avenues to achieve a sense of mastery and control, comfort about living in a world which has some logic, a mechanism of fostering social solidarity and identity as well as a path for a life transformation through finding new values and sources of significance (Pargament, Koenig & Perez, 2000).

Within religious coping per se, significant correlations with quality of life were found within the negative religious coping mechanisms ($r=-0.205$, $p=0.0001$) in comparison to the positive ones ($r=0.065$, $p=0.140$) suggesting that religious struggle (negative religious coping) may have more salient effects because it is more ego-dystonic (thoughts and behaviors that are in conflict with the needs and goals of the ego) representing therefore a discontinuous change from prior modes of coping (Sherman, Plante, Simonton, Latif & Anaissic, 2009) on top of being an additional burden for people undergoing a stressful life situation. In fact, negative religious coping is a struggle stemming from a negative view of life, a feeling of being abandoned by God, something that could in turn result in negative psychological

adjustment to stress (Ano & Vasconcelles, 2005). The above-mentioned emerging pattern also applies to each of the sub-dimensions of quality of life (only negative religious coping mechanism correlated significantly with the sub-dimensions of quality of life) with one exception: significant correlations with quality of life were found also for positive religious coping but only in relation to the social dimension of quality of life ($r=0.117$, $p=0.007$), possibly due to the fact that positive religious coping mechanisms (such as seeking support from church members or attempting to provide religious support and comfort to others) incorporate the very many social aspects of religion and thus resulting in a higher perceived social well being by the patient. In other words, using social religious coping mechanisms (that are in fact part of positive religious coping mechanisms in general) might augment the patient's perceived social well being following his social involvement within a religious context.

As for the relations between religion and emotional distress, there seems to be a small but significant negative correlation between general religiousness and overall emotional distress ($r=-0.083$, $p=0.007$) as well as with the depression component of emotional distress ($r=-0.085$, $p=0.022$), results that are consistent with several studies putting forward the buffering effects of religion on emotional distress (Dezutter, Luyckx, Robertson & Hutsebaut, 2010; Ellison, Boardman, Williams & Jackson, 2001). Stronger and positive correlations, however, were found between the negative component of religious coping and overall emotional distress ($r=0.265$, $p=0.002$) as well as with its sub-dimensions anxiety ($r=0.167$, $p=0.049$) and depression ($r=0.205$, $p=0.010$) suggesting that individuals who reported to use negative forms of religious coping experienced more depression, anxiety and distress in general. This means they used religious coping strategies ineffectively, since translating their religious beliefs into unhelpful strategies promoted (rather than prevented) depression and anxiety (Boscaglia, Clarke, Jobling & Quinn, 2005). In other words, the use of negative

religious coping might be a manifestation of poor psychological and illness adjustment due to the emotional struggle with faith and the created religious doubt as implied by the use of such coping mechanisms (Pargament et al., 1998). Concerning positive religious coping strategies, neither quality of life nor emotional distresses were found to significantly correlate. This finding is inconsistent with most of previous studies in the field that found that positive religious coping strategies may serve some adaptive functions (Ano & Vasconcelles, 2005; Tarakeshwar et al., 2006), although the research on positive religious coping is less clear (Lavery & O'Hea, 2011). One reason for this could be the relatively small number of articles analyzed for this relationship, therefore masking a potentially existing correlation between positive religious coping and quality of life and emotional distress, since the sample size may be a determining factor in studies in which a statistical significance is not found (Lyman Ott & Longnecker, 2010).

With respect to research question two, which analyzes the question of whether specific people turn to religion and spirituality in coping and under which circumstance it will enhance their quality of life and reduce their emotional distress, certain trends emerged in this study:

- Under the category of spirituality, for *higher educated patients*, the relations between spirituality and overall quality of life were stronger than for patients with a high school education (with the exception of the faith component of spirituality for which stronger relations were observed among patients with *a high school education*).
- As for the connections between religion and quality of life, as well as between religion and emotional distress, higher effect sizes in this study were observed among subjects with a *high school education* compared to those with a higher education.

This finding matches previous studies done in the field, showing stronger effect sizes for the religion-quality of life connections among subjects with a high school education (Banthia, Moskowitz, Acree & Folkman, 2007). Comparing the

moderating effects of education on religion-quality of life connections with its' moderating effects on spirituality-quality of life connections suggests that except for the faith component of spirituality (which is more related to religious concepts such as religious beliefs) religion and spirituality should be seen as qualitatively differing from each other. Specifically, the emerging different moderating pattern of education in relation to religion vs. spirituality could be due to the unique nature of the meaning-making process of spirituality in comparison to religion. The ability to create a meaning from the illness (in contrast to holding on a religious/ spiritual belief system) is an active cognitive effort reflecting on the patient's ability to cope with the illness and to draw on values, beliefs and goals in order to modify the meaning of a stressful situation. (Park & Folkman, 1997). Since higher education correlates with higher cognitive abilities (Johnson, McGue & Iacono, 2005), cognitive abilities that might be a necessity once trying to construct a new meaning from a stressful life situation, it is not surprising that among t higher educated subjects, the effect sizes observed for the spirituality-quality of life connections were higher.

- The more *time passed since the diagnosis* was first given, the smaller the effect sizes were for the spirituality-quality of life connections, and for the spirituality-emotional distress connections. Exceptional was the meaning component of spirituality, for which, the more the time went by since the diagnosis was first given, the stronger the effect sizes were between meaning and quality of life. A potential explanation for that could be the fact that closer to the time in which the diagnosis is received, the previously held notions of the individual about the world and his place in it, are not yet fully cognitively processed. Therefore, close to the diagnosis time, the individual tend to hold on his existing set of beliefs while the reconstruction of the event and

- the emergence of a new meaning and insight can occur only with a certain "outsider perspective" which is achieved over time (Mystakidou et al., 2008). In other words, the ability to construct a new meaning of the situation is more likely to occur in course of time. As for religion, time since diagnosis was found to significantly moderate religion- emotional distress connections only, showing the same pattern of reduced effect sizes in the course of time since the diagnosis was first given, weakening therefore the potential buffering effects of religion on perceived emotional distress. Bennett et al (2010) found that longer time since diagnosis per se, was associated with decreases in the individual's cognitive difficulties and social concerns, a potential explanation for the weaker necessity to use certain coping mechanisms such as religion or spirituality, mechanisms that might be consequently perceived as less beneficial (what therefore results in weaker effect sizes over time).
- As for the moderating effects of the *patient's age*, no consistent pattern could be observed. With respect to spirituality, the older the patient, the stronger the relations between spirituality–quality of life, but weaker for spirituality-emotional distress. Aldwin, Sutton, Chiara & Spiro (1996), found that elders tend to frequently underestimate the stressors they face, reflecting a developmental process that allows people, the older they get, to distance from strains and appraise aversive situations as less problematic. Consequently, age might reinforce a decrease in peoples' abilities to perceive stress levels associated with chronic strains and limitations, thus potentially influencing patients, the older they are, toward the perception of enhanced quality of life and reduced emotional distress, also in relation to spiritual topics. As for the religion - quality of life and religion-emotional distress connections, the same pattern could be observed (lower effect sizes with a progression in age) with one exception for the effect sizes of negative religious coping- emotional distress, in which higher

effect sizes were found with a progression in age. The different observed pattern could be attributed to the nature of the negative coping mechanism (e.g. redefining the stressor as a punishment from God, redefining God's power to influence the stressful situation, etc.) and its underlying negative cognitive attributions (unavailability of power and control and the perceived support from God). Those negative cognitive attributions can result in a psychological vulnerability (Lazarus & Folkman, 1984), thus potentially impairing the mentioned above ability to underestimate aversive life situations with the progression in age.

- *Type of cancer* was found to moderate the effect sizes of spirituality-quality of life connections, the spirituality-emotional distress connections and the religious coping–emotional distress connections, resulting in higher effect sizes for subjects with breast cancer, potentially pointing out the underlying influences of gender on the higher reported effect sizes for breast cancer patients. Specifically, socialized gender norms shape the expectations regarding the type of coping style expected from men (toward more problem–focused coping styles) and thus negatively affecting the efficacy of men's ability to use emotion–focused coping (such as through the use of religion and spirituality) (Hoyt, 2009). The same explanation applies to the observed higher effect sizes for women in comparison to men under the spirituality-emotional distress and religious coping–emotional distress connections. Little about the moderating effects of 'type of cancer' can be said about the higher effect sizes observed within those studies done on patients with diverse types of cancer (e.g. studies including 10% subjects with lung cancer, 40% with breast cancer, 30% with prostate cancer and 20% with other type of cancer). The reason for that would be that in each of those studies included under the category of 'diverse type of cancer' there was an enormous existing heterogeneity between the subjects and between the

different studies under this category, thus preventing to reach a firm conclusion about the reason for the observed higher effect sizes under the category 'diverse types of cancer'.

- *Stage of cancer* as a moderating variable was observed only within the spirituality-quality of life connections, and within the religious coping-emotional distress connections, with higher effect sizes for patients with an early stage of cancer (0-2). Only regarding the meaning component within the spirituality-quality of life relationship, higher effect sizes were observed for those subjects with advanced cancer, again reflecting the importance of meaning making process especially once dealing with end of life phases (Greenstein & Breitbart, 2000; Breitbart & Heller, 2003).

To summarize, theory claims that concerns aroused by the disease as well as the function of certain religious and spiritual coping mechanisms may vary as a function of illness variables such as type and site of malignancy (e.g. important areas of functioning such as sexuality may have particular existential importance and stimulate the use of religious/spiritual resources), functional status or as a function of background variables such as gender (religious/spiritual coping seems to be used more by women than by men), ethnicity (used more by Coloured people than by Caucasian) and socioeconomic status (used more by individuals with lower income than by those with a higher income). Background variables such as different religious backgrounds and the individual's religious and non-religious resources may also affect religious and spiritual coping activities (Jenkins & Pargament, 1995). Within this study some of the addressed variables and additional variables (according to availability) were presented and analyzed, indicating once more the complexity of human being in general and abstract construct such as spirituality in human's coping process in particular.

This study also includes some limitations. Although numerous empirical researches on the relationship between religion / spirituality and psycho-social well-being in cancer patients were analyzed at a meta-level, leading to results indicating that spirituality contributes to cancer patients' well-being while religion contributes to patients' well-being only under certain conditions while jeopardizing it under others, it is not possible to deduce any causality from these results since most of the studies included in the meta-analysis were cross-sectional and not longitudinal. Thus, deriving conclusions about a cause-and-effect relationship is impossible at this stage. Additional limitations derive also from the fact that most of the studies included in the meta-analysis were studies that were done in the USA, thus preventing from generalizing the conclusions also to other countries that might differ in their religious/spiritual beliefs and practices. A limitation also derives from the fact that most of the studies were done on Christians, very few on Jews and none on Muslims. This again prevents from generalizing the conclusions to other religious affiliations than Christians. Conclusions about the moderating effect of illness and demographic variables also need to be adopted with care since many studies did not report on cancer stage or cancer type or reported on subjects with mixed types of cancer or stages. Furthermore, a clear bias towards breast cancer as type of cancer within the sample somewhat limits the ability to claim conclusions for other types of cancer. Last, since the research methodology used in this study was a meta-analysis, a research method that analyses and draws conclusion from existing data, new knowledge could not be created, thus limiting the value of this study to a better comprehension of the field but not to a creation of a new one.

Following the different existing limitations as mentioned above, a suggestion for further research areas can be made. Specifically, since the importance of religion and spirituality as a coping mechanism with cancer across different cultures is still unclear, it seems that one potential area for further research could be testing the religion / spirituality-

health connections within different societies and within different religious affiliations in each of those societies (e.g. secular patients vs. orthodox ones). In addition, research should also focus on examining the connections between religion/ spirituality and health using specific cancer groups that are similar in terms of length of illness (e.g. newly diagnosed) and similar in the type of cancer. Also, studies could thereby expand beyond subjects with breast or prostate cancer to other types of cancer that are usually less researched (e.g. gynecological cancer). As for the methodology proposed, studies should be longitudinal in design, informing not only about the short but also about the long term effects of both positive and negative coping strategies, and on the variation of those coping strategies over time in relation to other variables. In other words, to understand the degree to which possibly related construct such as hope, forgiveness, sense of coherence etc. affect the relationship between religion and spirituality with health and coping. In addition, since different studies used various assessment tools to measure different aspects of religion and spirituality and different outcome variables, a uniform approach to the assessment and design of studies will be needed in the future in order to reach firmer conclusions about the relationships between religion / spirituality and psycho-social well-being in cancer patients. Qualitative studies are then needed in order to understand the exact underlying concepts of broader terms such as 'meaning' or 'spiritual beliefs' since making a clear distinction between religion and spirituality is not always easy. A clearer definition of 'positive religious coping' vs. 'negative religious coping' will also be needed since religious coping mechanisms under the term 'positive' didn't always have a positive effect on the psycho-social well being of the subjects. Also religious coping mechanisms under the category of 'negative' didn't have in each single study a negative connection with psycho-social well being among cancer patients, leading therefore to the conclusion that more accurate definitions in that respect are more than a necessity. In other words, future research should take each of the existing religious coping

mechanisms (e.g. benevolent reappraisal) and test them separately without categorizing them in advance as positive or negative. As for the limitations derived from the present used research methodology, future studies should empirically test the relations between religion / spirituality and psycho-social well being taking into account specific segments of the cancer population following the different suggestions as mentioned above.

5. Conclusions

The constructs of religion and spirituality are distinguishable but overlapping encompassing attitudes, values, convictions, and practices either defined by the borders of an institutional belonging (religion) or existing outside any religious system (spirituality).

As for the connections of religion and spirituality with psycho-social well-being among cancer patients, the emerged patterns in this study seem to direct toward the conclusion that in the context of an illness in general and in the context of oncology in particular, spirituality is the main variable important in understanding how patients cope with a potentially terminal illness. Specifically, re-establishing a sense of meaning (order, coherence and purpose in one's existence) in the encounter of an aversive life event seems to be extremely important for a better psycho-social adjustment among cancer patients. Those conclusions can be regarded as highly reliable since the observed correlations between spirituality and quality of life and between spirituality and emotional distress in the overall computed results were very high (mainly $r > 0.5$), following an analysis that was carefully carried out, ensuring for a constant quality assessment.

As for religion, it seems that religion can facilitate coping in some patients and impede it in others, due to the impact of specific religious functions, beliefs and practices (e.g. positive vs. negative religious coping mechanisms) and due to background, situational and contextual variables that may have an effect on adjustment through the religious coping processes and associated functions that they influence. Yet, the results concerning 'religion' should be more carefully interpreted due to the large existing heterogeneity of the studies that were included under the term "religiousness", a term incorporating different sub-types of religion such as religious practice, religious affiliation and more.

As for the question: "is religion or spirituality more helpful to some people than others?", there seems to be a dependency on how easily those coping resources can be accessed, on how large is the part of those constructs in the individual's orienting system, on the underlying nature of those spiritual / religious practices and beliefs and on the context of cancer in a particular person's life.

We can only conclude with saying that cancer diagnosis means reflecting on questions of life and death, mortality and immortality or as claimed by Sulmasy (1999, p 1003): "Illness is a spiritual event. Illness grasps persons by the soul and by the body and disturbs them both", therefore creating urgency for those questions to be reconsidered and answered. In that respect, the present study pointed out to the notion that finding a sense of meaning in life, a belief that life has a purpose, that life is a gift and that illness gives the possibility to work toward personal growth, peace and transcendence is related the most to psycho-social well being among cancer patients. Religion on the other hand, has positive and negative implications on health and well being, depending on what type of religion it is (general religiousness vs. religious coping positive / negative).

However, neither religion nor spirituality is a simple one dimensional construct, therefore creating a complex picture especially once dealing with a life-threatening illness such as cancer. Therefore it is important to address patient's spiritual and religious needs when existing and tune existing beliefs and practices in a way that will help the patient reconstruct a positive meaning of the event, illuminating the potential great opportunities presented by religious and spiritual concepts when coping with a life threatening illness such as cancer. Physicians should therefore refer to patients' spiritual concerns and needs in order to give the patient the possibility to ameliorate the experience of suffering by helping the patient finding a sense of meaning and continuity, often found within a spiritual or religious context, or more broadly speaking, through a broader humanistic or spiritual connection with

the human condition. Physicians and psychotherapists should explore patients' religious and spiritual coping strategies and determine whether those strategies serve as a resource or as a burden for them in coping, and be especially attentive to themes reflecting spiritual struggles when working with those patients. Referring to religious and spiritual themes seems to be particularly important in the context of palliative care in order to help patients to effectively cope with the process of end of life and the inferred self-annihilation. Specifically, meaning-centered psychotherapy (Breitbart et al., 2010) as a short-term intervention for clinicians meant to help patients with advanced cancer to sustain or enhance a sense of meaning and purpose in life seems to have a great value for cancer patients at the end of life. Meaning-centered group psychotherapy was found to significantly enhance spiritual well-being and to reduce anxiety, hopelessness and desire for death among patients with advanced cancer, indicating once more that spiritual topic should be also implemented in clinical settings.

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Appendix

Coded data (illustrative example)	160
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Coded data (illustrative example)

Number of study	Publication First author type	Publication year	N	% male	M_AGE	M_STATUS	EDU	SOC-ECON_STAUS	ETHNIC	GEOGRAPH Y	HIST_MEN TAL	HEALTH_STAT	TREAT_TYP E	CANCER_STAGE	CANCER_TYP E	TIME_DIAG	INC_CRITER
1	Tarakeshwaijournal	2006	170	54%	57.46	married=59%	at least high school education=61.2%	not stated	White=65.9%	USA	YES	1 (performance stal not stated)		Advanced stage	not stated	not stated	advanced cancer, diagnosis at a participating site,age 20 years or younger, identified unpaid caregiver, adequate stamina to complete the interview
1	Tarakeshwaijournal	2006	170	54%	57.46	married=59%	at least high school education=61.2%	not stated	White=65.9%	USA	YES	1 (performance stal not stated)		Advanced stage	not stated	not stated	advanced cancer, diagnosis at a participating site,age 20 years or younger, identified unpaid caregiver, adequate stamina to complete the interview
1	Tarakeshwaijournal	2006	170	54%	57.46	married=59%	at least high school education=61.2%	not stated	White=65.9%	USA	YES	1 (performance stal not stated)		Advanced stage	not stated	not stated	advanced cancer, diagnosis at a participating site,age 20 years or younger, identified unpaid caregiver, adequate stamina to complete the interview
1	Tarakeshwaijournal	2006	170	54%	57.46	married=59%	at least high school education=61.2%	not stated	White=65.9%	USA	YES	1 (performance stal not stated)		Advanced stage	not stated	not stated	advanced cancer, diagnosis at a participating site,age 20 years or younger, identified unpaid caregiver, adequate stamina to complete the interview
1	Tarakeshwaijournal	2006	170	54%	57.46	married=59%	at least high school education=61.2%	not stated	White=65.9%	USA	YES	1 (performance stal not stated)		Advanced stage	not stated	not stated	advanced cancer, diagnosis at a participating site,age 20 years or younger, identified unpaid caregiver, adequate stamina to complete the interview
1	Tarakeshwaijournal	2006	170	54%	57.46	married=59%	at least high school education=61.2%	not stated	White=65.9%	USA	YES	1 (performance stal not stated)		Advanced stage	not stated	not stated	advanced cancer, diagnosis at a participating site,age 20 years or younger, identified unpaid caregiver, adequate stamina to complete the interview

Number of study	First author	EXC_CRITER	IND_VA R	SUB_IN D_VAR	ADD_SUB_IND_VAR	ASS_TOOL_I ND	DEP_VAR	SUB_DEP_VAR	ASS_TOOL DEP	STAT_TES T	RESULTS Z value (ASS_TIME1	SIGN_PARAME TER	r x N (T1)	r effect size	
1	Tarakeshwar	dementia or delirium, inability to speak english or spanish	REL	RC	RCp	MMRS	QOL	PHY	McGill	Beta	0.3447	-0.043	0.635	-4.488	-0.026
1	Tarakeshwar	dementia or delirium, inability to speak english or spanish	REL	RC	RCp	MMRS	QOL	PHY_SYM	McGill	Beta	-2.3661	-0.22	0.009	-30.855	-0.18
1	Tarakeshwar	dementia or delirium, inability to speak english or spanish	REL	RC	RCp	MMRS	QOL	PHYCH	McGill	Beta	-1.0279	0.124	0.152	13.396	0.0788
1	Tarakeshwar	dementia or delirium, inability to speak english or spanish	REL	RC	RCp	MMRS	QOL	EXIS	McGill	Beta	-2.5762	0.255	0.005	33.592	0.197
1	Tarakeshwar	dementia or delirium, inability to speak english or spanish	REL	RC	RCp	MMRS	QOL	SUPP	McGill	Beta	-3.0905	0.285	0.001	40.29	0.237
1	Tarakeshwar	dementia or delirium, inability to speak english or spanish	REL	RC	RCp	MMRS	QOL	TOTAL QOL	McGill	Beta	-1.7173	0.173	0.043	22.389	0.13

Manual code

From each study the following characteristics were coded:

A) Study characteristics:

Study number

Author name

Publication type

Publication year

B) Sample characteristics:

Sample size (N)

Mean age (in years)

Gender (female/ male)

Marital status (single, married/living with a partner, divorced, widowed)

Education level (⁸high school education / high education)

Socio- economic status (high / low)

Ethnicity (white / black/ Latino)

Geography (USA, Europe or else)

⁸ High school education refers to subjects with 12 years of school education or less while high education refers to subjects with 15 years of education or more

C) Medical characteristics (clinical features):

History of mental problems (yes/no)

Current health status (perceived health status, additional diseases, first diagnosis vs. recurrence)

Treatment type (surgery, radiation, chemotherapy or else)

Severity of disease (⁹cancer stage)

Type of disease (cancer type)

Time since primary diagnosis (in months)

D) Methodological characteristics:

Inclusion criteria

Exclusion criteria

Recruitment of patients (primary care, secondary care, ambulatory care, data collection from previous studies or else)

Independent variable (including sub types)

Dependent variable (including sub types)

Assessment tool dependent and independent variables

Statistical test used

Results at each measurement time (if more than one measure time existed)

⁹ Cancer stage is divided to early stage (0-2) and advanced stage (3, 4 or terminal stage)

Significance of results (p value)

Comments

Sample description

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Alferi et al. (2009)	to examine the relationship of religiosity and distress in a sample of hispanic women newly diagnosed with BC	46 (34 Catholic, 12 evangelic al)	Abbreviated version of the COPE (Carver, Scheier & Weintraub, 1989), the General Social Survey (Davis & Smith, 1989)	Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	The relationship between religiosity and emotional distress depends on one's religious affiliation. Higher levels of religiosity were connected to lower emotional distress among evangelical women but to higher emotional distress among catholic ones
Assimakopulos et al. (2009)	To evaluate the association between religiosity and QOL among Greek Christian orthodox cancer patients receiving chemotherpie	118	the System of Belief Inventory (SBI-15) (Holland et al., 1998).	The EORTC QLQ C-30 (Aaronson et al., 1993).	Levels of religiosity were only weekly correlated with patient's QOL
Baider et al. (1999)	To examine relationship between religion and level of distress and effective coping in patients with melanoma – an Israeli sample	100	the System of Belief Inventory (SBI) (Holland et al., 1998)	Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971), the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983)	There are sign. Positive correlations between the SBI-15 and active coping style as well as negative correlations with anxiety and depression among those melanoma patients
Balboni et al. (2007)	To examine religiousness and spiritual support in advanced cancer patients and associations with QOL, treatment preferences and advance care planning.	230	RCOPE (Pargament, Koenig & Perez, 2000).	McGill Quality of Life Questionnaire (Cohen, Mount, Strobel & Bui, 1995)	Spiritual support is associated with better QOL

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Boscaglia et al. (2005)	To determine whether spiritual involvement and positive and negative religious coping could account for any of the variation in anxiety and depression among women with GC	100	The Spiritual Involvement and Belief Scale – revised (Hatch, Burg, Naberhaus & Hellmich, 1998)	The State – Trait Anxiety Inventory (STAI), (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983). Back Depression Inventory for Primary Care (BDI-PC) (Steer, Cavalieri, Leonard & Beck, 1999)	Negative religious coping was associated with more anxiety and more depression. Additionally, patient with lower spiritual coping tended to be more depressed.
Brady et al. (1999)	To examine if there is a positive association between SP & QOL in cancer patients, if the relationship is unique	1610	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996).	Spirituality was found to be uniquely associated with QOL
Büssing et al. (2008)	To investigate the relationship between intrinsic religiosity and depression among cancer patients	396	the Reliance on God's help (RGH) with alpha of 0.917 (Buessing, Fischer, Ostermann & Matthiessen, 2009)	the Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar, 2002)	Depression was connected to internal adaptive coping styles such as positive attitude rather than to intrinsic religiosity
Canada et al. (2008)	To employ confirmatory factor analysis to test whether there was evidence for a 3 factor solution for the FACIT-SP	240	FACIT-SP (Cella et al., 1993)	The Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983), SF-12 (Ware, Kosinski & Keller, 1996)	The results of the study support a 3 factor solution for the FACIT-SP

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Cole (2005)	To compare the efficacy of spiritual – focused psychotherapy for people diagnosed with cancer to a no treatment control group in terms of physical and psychological WB	16	RCOPE (Pargament, Koenig & Perez, 2000)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996). The Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983).	Positive religious coping was related to less ED and more WB while negative religious coping showed a positive relation with ED and a negative one with WB.
Cotton et al. (1999)	To examine the relationship between spirituality, QOL and psychological adjustment in women with BC	142	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), The Mental Adjustment to Cancer (MAC) (Mistakidou et al., 2005)	Spirituality is correlated with both QOL and adjustment, although complex and indirect after controlling for demographic variables.
Dapueto et al. (2005)	To depict the relationship between spirituality among physical, psychological and socio-cultural factors with QOL among cancer patients	309	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	Spiritual well being is a potential influential factor on patient's QOL
Dugherty et al. (2005)	To examine the role of spirituality in terminally ill cancer patients	162	Functional Assessment of Cancer Therapy Spiritual - FACIT-SP (Cella et al., 1993), Religious Problem Solving Scale (Pargament et al., 1988)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	There are sign. Associations between spirituality and quality of life, but not between religious coping and quality of life among cancer patients volunteering for clinical trials of experimental agents

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Edmondson et al. (2008)	To examine the relationships between religious well being (RWB) and HRQOL, and whether those relationships are mediated by existential well being (EWB) component.	237	FACIT-SP (Cella et al., 1993)	SF-12 (Ware, Kosinski & Keller, 1996).	Existential well being component fully mediated the relationship between religious well being and HRQOL and explained unique variance in both the physical and the mental component in HRQOL.
Filazoglu & Griva (2008)	To investigate the role of social support and coping in HRQOL among Turkish cancer patients	188	The religious subscale of the Ways of Coping Inventory (WCI) (Folkman & Lazarus, 1985)	SF-36 (Ware, n.d)	Religious coping subscale was significantly associated with the physical and the mental component of QOL
Fitchett et al. (2004)	To examine the prevalence and correlates of religious struggle and mental health	97	RCOPE (Pargament, Koenig & Perez, 2000)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996). Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	Religious struggle is associated with emotional distress in oncology patients
Gall et al. (2000)	To explore the role of religious resources in long term adjustment to BC	32	The God Image Scale (GIS) (Lawrance, 1997), Religious Coping Activities Scale (RCAS), (Pargament et al., 1990).	by the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983), the Life satisfaction questionnaire (LSQ) (Carlsson & Hamrin, 1996)	Both relationship with God or God's image and religious coping behavior were related to cancer survivors' well being, although complex, since different types of relationship with God and religious coping demonstrated different associations with well being.

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Gall (2000)	To explore the role of religious coping in long term adjustment to BC	52	The God Image Scale (GIS) (Lawrance, 1997), Religious Coping Activities Scale (RCAS), (Pargament et al., 1990).	by the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983), the Life satisfaction questionnaire (LSQ) (Carlsson & Hamrin, 1996)	Religious resources predicted emotional well being for those long term cancer survivors.
Gall (2004)	To explore the relationship with God with respect to the QOL of prostate cancer survivors	34	Religious and Spiritual Attribution (RSA) (Pargament & Hahn, 1986), the God Image Scale (GIS) (Lawrance, 1997), the God Image Descriptors (GID) (Gorsuch, 1968)	SF-36 (Ware, n.d)	Relationship with God was a significant factor in the prediction of role, emotional and social functioning. Different aspects of the relationship with God resulted in different associations with the dependent variables mentioned above.
Gall (2004)	To explore the role of religious coping in men's long term adjustment to prostate cancer	34	Religious Coping Activities Scale (RCAS) (Pargament et al., 1990).	SF-36 (Ware, n.d)	Religious coping behavior was related to lower levels of role, social and emotional functioning
Gall et al. (2009)	To investigate the mobilization of religious coping in women's response to breast cancer	160	RCOPE (Pargament, Koenig & Perez, 2000)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996). Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	The nature of the relationship between religious coping and emotional adjustment depend on the type of religious coping as well as the specific time of assessment

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Gall et al. (2009)	To investigate the potential role of religious / spiritual beliefs in providing a cognitive framework or understanding and responding to the diagnosis of BC	93	The God Image Descriptors (GID) (Gorsuch, 1968)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996). Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	A positive image of God was related to greater distress while a negative image of God was indirectly related greater distress through pathways of positive attitude and social well being. Inverse relationships between religiousness and distress could be observed <i>only</i> at pre-diagnosis.
Hamrick & Diefenbach (2006)	To examine short term impact of daily religious and spiritual experience among localized prostate cancer on cancer recurrence worry	254	Fetzer multidimensional measure of Religiousness and Spirituality (F.I.N.I.o.A.W. Group, 1999)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996).	Positive benefits of religious coping / practices were restricted to those patients with higher vs. lower level of post-diagnosis increase in religiosity
Hebert et al. (2009)	To test whether changes in positive and negative religious coping in women with BC predict changes in WB over time, and whether this relationship is moderated by cancer stage.	284	RCOPE (Pargament, Koenig & Perez, 2000)	the Center for Epidemiological Studies Depression Scale (CES-D), (Radloff, 1977), SF-36 (Ware, n.d), the Satisfaction with life scale (SWLS) (Diener, Emmons, Larsen & Griffin, 1985)	Negative religious coping methods predict worse mental health and life satisfaction in women with BC

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Hills et al. (2005)	To explore the relationship between spirituality, religious coping and symptom distress in palliative care consultation	31	RCOPE (Pargament, Koenig & Perez, 2000)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	Negative religious coping was positively associated with distress, confusion, depression and negatively associated with physical and emotional well being as well as QOL
Holland et al. (1999)	To investigate the role of religious and spiritual beliefs in ambulatory patients coping with melanoma	117	the System of Belief Inventory (SBI) (Holland et al., 1998)	Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971), the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983)	No correlation was found between SBI-15 and ED. Positive correlation was found between the SBI to active – cognitive coping style
Janiszewska et al. (2008)	To assess the intensity of anxiety in different stages of BC and to define the relationship between religiousness and an effective coping strategy at any BC stage	180	Scale of Personal Religiousness (SPR) (Jarowski, 1989)	The State – Trait Anxiety Inventory (STAI), (Spielberger, Gorsuch, Lushene, Vagg & Jacobs, 1983)	Religiousness is an effective factor of coping with anxiety only at the end stage breast cancer patients.

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Jung-won & Jaehee (2009)	To examine the effect of religiosity, spirituality and social support on QOL	161	The spiritual subscale of the Quality of Life Cancer Survivor (QOL-CS) measure	SF-36 (Ware, n.d), by the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983)	Religiosity and spirituality were related to some outcomes in QOL of Korean and Korean American patients. The effect on QOL however was not strong after controlling for covariates. Social support partially mediated the effect between SP and QOL but only among the Korean American cancer survivors
Krupski et al. (2006)	To determine whether spirituality predicts HRQOL outcomes among low income men with prostate cancer	224	FACIT-SP (Cella et al., 1993)	SF-12 (Ware, Kosinski & Keller, 1996), Symptom of Distress Scale (SDS) (McCorkle, 1987), the Medical Outcomes Study 5-item Mental Health Index (MHI) (Berwick et al., 1991).	Low spirituality was associated with worse physical and mental health in low income men with prostate cancer

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Laubmaier et al. (2004)	To examine whether spirituality is associated with benefits in cancer's patients regardless of life threat or whether it is associated with more benefit to those who perceive a high degree of life threat. Additionally, it was examined which components of SP account for the greater portion of variance in the relations of spirituality with psychological adjustment and QOL.	95	The Spiritual Well Being scale (Carson, Soeken, Shanty & Terry, 1990).	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), The Global Severity Index (Derogatis & Melisaratos, 1983)	Spirituality was related to less distress and better quality of life regardless of perceived life threat. The existential component of spirituality compared to the religious component of spirituality accounted for a major portion of the variance in these outcomes.
Levine et al. (2009)	To compare differences in use of prayer between BC survivors from different ethnic groups and to examine how the use of prayer and spirituality are related to mood and QOL	175	Open question regarding prayer. FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996). Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	There were no differences in terms of ED and QOL between those who prayed compared to those who did not pray. Regarding spirituality, women with higher overall spirituality had significantly higher QOL and less ED

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Levine & Targ (2002)	To examine the role of spirituality in increasing functional abilities and functional QOL and to examine which aspects of spirituality are more relevant to coping with cancer	191	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996). Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971), the Mini-Mental Adjustment to Cancer (Mini MAC) (Watson et al., 1994).	Spiritual well being correlates with less distress and with greater functional and physical well being.
Manning-Walsh (2005)	To examine the relationships between spiritual struggle, QOL and life satisfaction	100	RCOPE (Pargament, Koenig & Perez, 2000)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996).	Spiritual struggle is connected to lower QOL and life satisfaction
Manning-Walsh (2005)	To examine the relationship between symptom distress and psycho-spiritual well being in women with BC	100	FACIT-SP (Cella et al., 1993)	The Symptom of Distress Scale (SDS) (McCorkle, 1987)	Symptom distress was inversely related to psycho-spiritual well being

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
McClain (2003)	To assess the relations between SP and depression and end of life despair in terminally ill cancer patients	160	FACIT-SP (Cella et al., 1993)	The Schedule Attitude Hastened Death (SAHD) (Mystakidou et al., 2008), the Hamilton Rating Scale for Depression (HDRS) (Lopez – Pina, Sanchez-Meca & Rosa Alcazar, 2009), Beck Hopelessness scale (BHS) (Beck, Weissman, Laster & Trexler, 1974)	Spirituality offers some protection against end of life despair
McCoubrie & Davies (2006)	To examine whether there is a correlation between spirituality and anxiety and depression in patients with advanced cancer	85	The Spiritual Well being Scale (SWBS), (Carson, Soeken, Shanty & Terry, 1990)	the Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar, 2002)	There is a significant negative correlation between spirituality and anxiety and depression among patients with advanced cancer
Meraviglia (2002)	To adapt an instrument to assess prayer activities, experiences and attitudes for people with cancer	32	the Paloma and Pendleton's Prayer Scale (PS) (Paloma M.M & Pendleton B.F., 1991)	the Paloma and Pendleton's Prayer Scale (PS) –specific subscale (Paloma M.M & Pendleton B.F., 1991)	More prayer activity is related to low levels of functional status

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Meraviglia (2004)	To examine the effects of spirituality on well being in people with lung cancer	54	The life attitude profile – revised (LAP- R) questionnaire (Recker & Peacock, 1981), The Adapted Prayer Scale (APS), (Meraviglia, 2006)	The Symptom of Distress Scale (SDS) (McCorkle, 1987), the Index of Well Being (IWB (Campbell, Converse & Rodgers, 1976).	Aspects of spirituality, meaning in life and prayer have positive effect on psychological and physical responses in people with lung cancer
Meraviglia (2006)	To examine the effects of spirituality on well being in women with BC	84	The Adapted Prayer Scale (APS) (Meraviglia, 2006), The life attitude profile – revised (LAP- R) questionnaire (Recker & Peacock, 1981)	Index of Well Being (IWB), (Campbell, Converse & Rodgers, 1976), the Symptom of Distress Scale (SDS) (McCorkle, 1987)	Strong relationship exist among spirituality and well being, mediated by meaning component
Morgan et al. (2006)	To explore the relationships of spiritual well being , religious coping and quality of life in African American women in the acute stage of coping with their BC	11	RCOPE (Pargament, Koenig & Perez, 2000), FACIT- SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	Significant relationships were found between spiritual well being and quality of life, in addition to a negative sign. Correlation found between negative religious coping and physical quality of life

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Nairn & Merluzzi (2003)	The study tests a model of adjustment to cancer in which social support, disease impact and religious coping were hypothesised to have an impact on cancer adjustment, mediated by self efficacy.	292	Religious Problem Solving Scale (Pargament et al., 1988)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	The study indicates that religious coping has no relationship with quality of life in cancer patients
Nelson et al. (2009)	The study aims to develop a theoretical framework of the relationship among religiosity, spirituality and depression	367	Age of Universal I-E Scale 12 (Gorsuch & Venable 1983 in Maltby, 2002)	was the Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar,2002)	In examining religiosity and spirituality, the main component that may help to reduce depression is meaning and peace.
Noguchi et al. (2004)	To assess the reliability and validity of the Japanese version of the FACIT-SP	306	FACIT-SP (Cella et al., 1993)	The Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar,2002), The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996),	The Japanese version of the FACIT-SP is valid and reliable and a useful tool in the study of spirituality among Japanese cancer patients
O'Connor et al. (2007)	To report on the relationships between spirituality, quality of life and psychological adjustment in patients with Leukaemis	40	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), The Mental Adjustment to Cancer (MAC) (Mistakidou et al., 2005)	Spirituality was positively correlated with QOL and negatively correlated with ED

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Peterman et al. (2002)	To establish the factor structure, reliability and internal validity of the FACIT-SP in people within two samples of cancer patients	1575	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)
Prince-Paul (2008)	To investigate the role of spiritual well being in the overall QOLEOL when controlling for physical symptoms	50	JAREL spiritual well being scale (Hungelmann, Kenkel-Rossi, Klassen & Stollenwerk, 1989)	the QUAL-E (Steinhauser et al., 2002)	Strong positive correlations were found between spirituality to QOLEOL
Purnell et al. (2009)	To investigate the relationships between religious practice, spirituality and QOL and stress in survivors of BC	130	Social Network Index (SNI) assessing social relationships with members of religious group (Cohen, Doyle, Skoner, Rabin & Gwaltney, 1997 in Barrera, Toobert, Angell, Glasgow & Mackinnon, 2006), FACIT-SP (Cella et al., 1993).	The Impact of Event Scale (IES) (Sundin & Horowitz, 2002), SF-36 (Ware, n.d).	SP was significantly correlated with QOL and traumatic stress, whereas religious practice was not sign. Correlated with those variables.
Ripentropp et al. (2006)	To consider spirituality and religiosity as separate constructs and to examine their relationships with quality of life in cancer patients	61	FACIT-SP (Cella et al., 1993), the Duke Religious Index (Koenig, Parkerson & Meador, 1997)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	While spirituality and religiosity are moderately inter-correlated, Spirituality has a stronger relationship with QOL than religiosity

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Romero et al. (2006)	To examine whether spirituality and self forgiving attitude were related to QOL and mood disturbance among women with BC in public sector outpatient clinic	81	The extent to which the patient consider himself religious/spiritual, one question on a 5 point likert type scale	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), Profile of Mood State (POMS) (McNair, Lorr & Droppelman, 1971)	Both a self forgiving attitude and spirituality were unique predictors of less mood disturbance and better QOL.
Ross et al. (2008)	To examine prayer for health and self reported health among a sample of man and women with personal cancer history	2184	Questions about prayer (e.g : "have you ever prayed specifically for the purpose of your own health?")	Question about self perception of health ("would you say that your health is excellent, very good, good, fair or poor?")	Overall praying for one's own health was inversely associated with good or better perceived health status
Sherman et al. (2005)	To evaluate religious coping among patients with multiple – myeloma undergoing stem cell transplantation	213	the Santa Clara Strength of Religious Faith (SCSORF) (Sherman et al., 2001), RCOPE (Pargament, Koenig & Perez, 2000).	the Hamilton Rating Scale for Depression (HDRS) (Lopez – Pina, Sanchez-Meca & Rosa Alcazar, 2009), the Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar, 2002), SF-12 (Ware, Kosinski & Keller, 1996).	Neither general religiousness nor positive religious coping were associated with any of the outcome measures. Negative religious coping on the other hand was associated with poorer functioning.

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Sherman et al. (2009)	To examine the role of general religiousness and positive and negative religious coping strategies on health outcomes among oncology patients	94	Santa Clara Strength of Religious Faith (SCSORF) (Sherman et al., 2001), RCOPE (Pargament, Koenig & Perez, 2000)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), the Brief Symptom Inventory (BSI) (Derogatis & Melisaratos, 1983)	Religious struggle may contribute to adverse changes in health outcomes for transplant patients, while general religiousness and positive religious coping did not have a strong effect on patients health outcomes
Shin et al. (2009)	To evaluate the correlates of existential well being with HRQOL in BC survivors	1933	The existential scale of the	The EORTC QLQ C-30 (Aaronson et al., 1993).	McGill Quality of Life Questionnaire, (Cohen, Mount, Strobel & Bui, 1995
Tarakeshwar et al. (2006)	To examine whether religious coping, positive and negative, is associated with the different dimensions of QOL among patients with advanced cancer.	170	The Multi dimensional Measure of Religion / Spirituality (MMRS) (Idler et. Al, 2003)	the McGill Quality of Life Questionnaire, (Cohen, Mount, Strobel & Bui, 1995)	Greater use of positive religious coping was associated with better overall QOL, although also with worse physical QOL. Negative religious coping was related to poorer QOL.
Tate & Forchheimer (2002)	To determine differences in QOL, life satisfaction and spirituality across different patients groups and to determine what factors may relate to these 3 outcomes across rehabilitation and cancer patients	72	FACIT-SP (Cella et al., 1993)	Satisfaction with life scale (SWLS) (Diener, Emmons, Larsen & Griffin, 1985), The Functional Living Index cancer (FLIC) (Schipper et al., 1984)	Spirituality showed a strong association with both QOL and life satisfaction.

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Tomich & Helgeson (2002)	To examine the relation of spirituality, meaning in life to QOL of both cancer survivors and healthy control	164	FACIT-SP (Cella et al., 1993)	SF-36 (Ware, n.d)	In both groups a continuous search of meaning in life had a negative impact on QOL. The strongest and most consistent correlate of QOL for both survivors and healthy women was having a sense of purpose in life
Whitford & Peterson	To investigate the role of spiritual well being in the assessment of QOL and ED in oncology patients	449	FACIT-SP (Cella et al., 1993)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996), The Mental Adjustment to Cancer (MAC) (Mistakidou et al., 2005)	Spiritual well being demonstrated a significant positive association with QOL, and a significant negative association with emotional distress
Wildes et al. (2009)	To evaluate the association of religiosity / spirituality and health related QOL among Latina BC survivors	117	System of Belief Inventory (SBI-15) (Holland et al., 1998)	The Functional of Cancer Therapy (FACT) (Fairclough & Cella, 1996)	SP was significantly and positively correlated with HRQOL among Latina BC patients
Yanez et al. (2009) (study one & two)	To examine spirituality and it's two component and their relations to psychological adjustment	418 (study 1) 165 (study 2)	FACIT-SP (Cella et al., 1993)	The Center for Epidemiological Studies Depression Scale (CES-D), (Radloff, 1977) and the Impact of Event Scale (IES) (Sundin & Horowitz, 2002), the SF-36 (Ware, n.d).	Meaning / peace component of spirituality predicted a decline in depressive symptoms and an increase in vitality. The ability to find meaning and peace in life is the more influential contributor for favorable adjustment during cancer survivorship

Author, pub. year	Study aim	Sample size	Religious / spiritual measures or items	Main outcome measures / items	Findings
Yates et al. (1981)	To examine the relations between religious beliefs and life satisfaction and happiness	36	the Religious Belief Index (RBI) (Yates, Chalmer, St. James, Follansbee & McKegney, 1981)	Self measures of life satisfaction and happiness (Yates et al., 1981)	Religious activities and connections were found to be associated with both life satisfaction and well being, while religious belief was correlated only with life satisfaction.
Zavala et al. (2009)	To determine how spirituality is associated with health – related quality of life in low income men with prostate cancer	86	FACIT-SP (Cella et al., 1993)	SF-12 (Ware, Kosinski & Keller, 1996).	Greater spirituality was associated with better HRQOL and psychosocial functioning among low income men with prostate cancer
Zwingmann et al. (2006)	To investigate the role of religious coping in a sample of German BC patients	156	The brief RCOPE (Pargament et al., 1998).	Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar, 2002)	Relationship between religious coping and psychosocial outcomes was completely mediated by non religious coping mechanisms
Zwingmann et al. (2007)	To investigate the power of religious commitment, positive and negative religious coping and their interaction as a predictor of anxiety.	167	The 10-items centrality scale (C-SCALE) (Huber, 2003 in Zwingmann, Müller, Körber & Murken, 2007), RCOPE (Pargament, Koenig & Perez, 2000)	The Hospital Anxiety and Depression Scale (HADS) (Baldacchino, Bowman & Buhagiar, 2002).	Positive and negative religious coping were more strongly related to anxiety than dispositional religious commitment.

Fail safe N values

Category	Fail safe N value
SWB- TOTAL QOL	7004
SWB-PHY	243
SWB-EMOT	945
SWB-SOC	509
SWB-FUN	1538
EWB- TOTALQOL	5573
EWB-PHY	539
EWB-EMOT	1553
EWB-SOC	64
EWB-FUN	1901
RWB-TOTAL QOL	527
RWB-PHY	12
RWB-EMOT	187
RWB-SOC	129
RWB-FUN	289
SWB-OVERALL ED	813
SWB-ANX	598
SWB-DEP	1348
EWB-OVERALL ED	1481

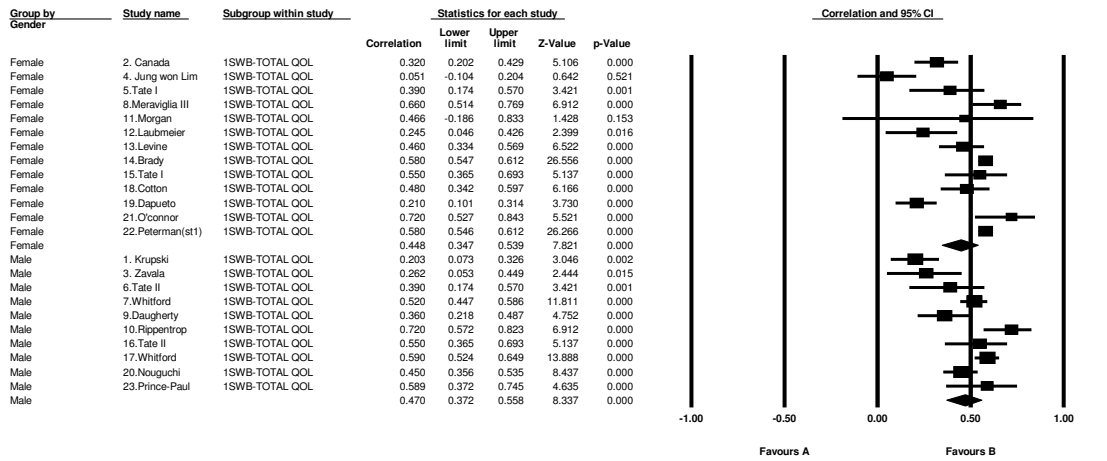
EWB-ANX	522
EWB-DEP	1683
RWB-OVERALL ED	Not relevant (results for this category were not significant)
RWB-ANX	271
RWB-DEP	Not relevant (results for this category were not significant)
REL -TOTAL QOL	115
REL-PHY	Not relevant (results for this category were not significant)
REL-EMOT	Not relevant (results for this category were not significant)
REL- SOC	Not relevant (results for this category were not significant)
REL-FUN	Not relevant (results for this category were not significant)
RCp-TOTAL QOL	Not relevant (results for this category were not significant)
RCp-PHY	Not relevant (results for this category were not significant)
RCp-EMOT	Not relevant (results for this category were not significant)
RCp-SOC	0
RCp-FUN	Not relevant (results for this category were not significant)

	were not significant)
RCn-TOTAL QOL	374
RCn-PHY	30
RCn-EMOT	49
RCn-SOC	10
RCn-FUN	3
REL-OVERALL ED	41
REL-ANX	Not relevant (results for this category were not significant)
REL-DEP	37
RCp-OVERALL ED	Not relevant (results for this category were not significant)
RCp-ANX	7
RCp-DEP	Not relevant (results for this category were not significant)
RCn-OVERALL ED	101
RCn-ANX	23
RCn-DEP	65

Graphs - second research question

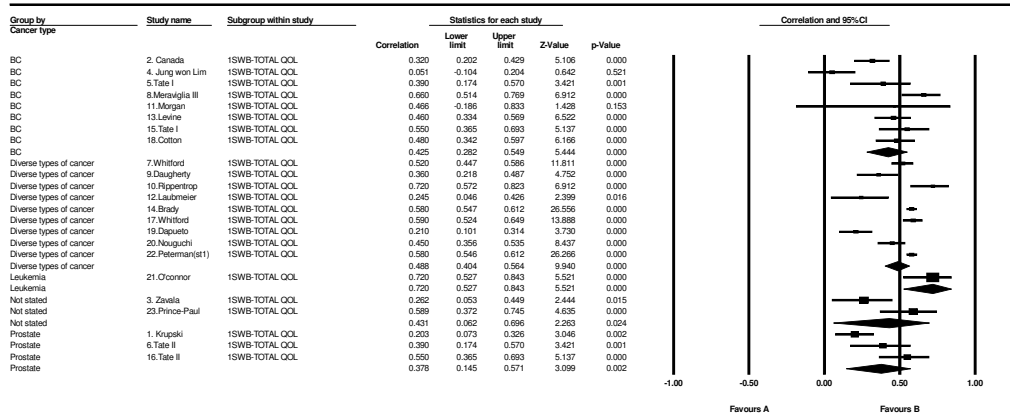
Gender for SWB-QOL

Meta Analysis



Cancer type for SWB-QOL

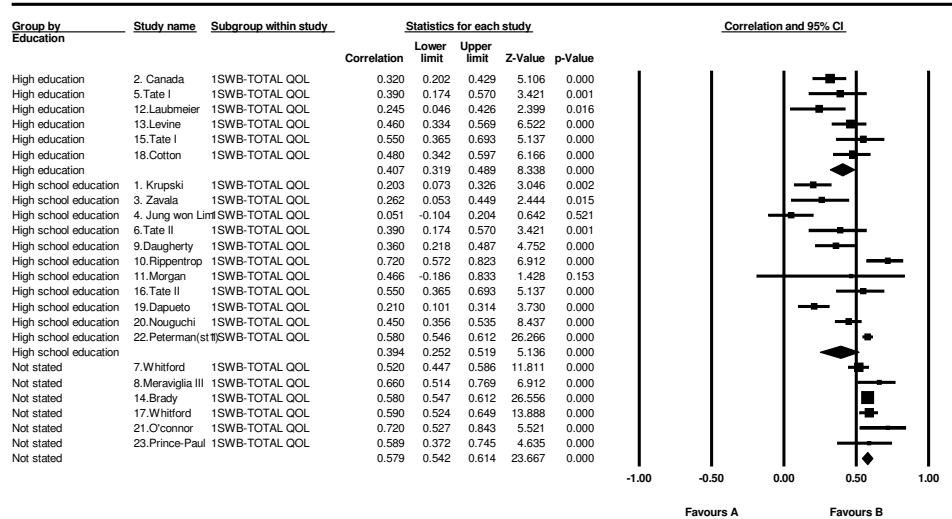
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Meta Analysis

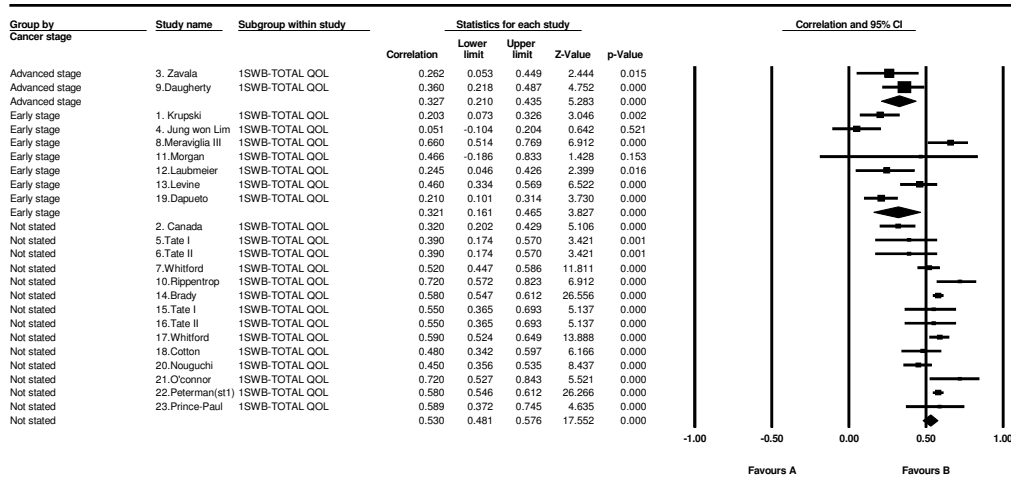
Education for SWB-QOL

Meta Analysis

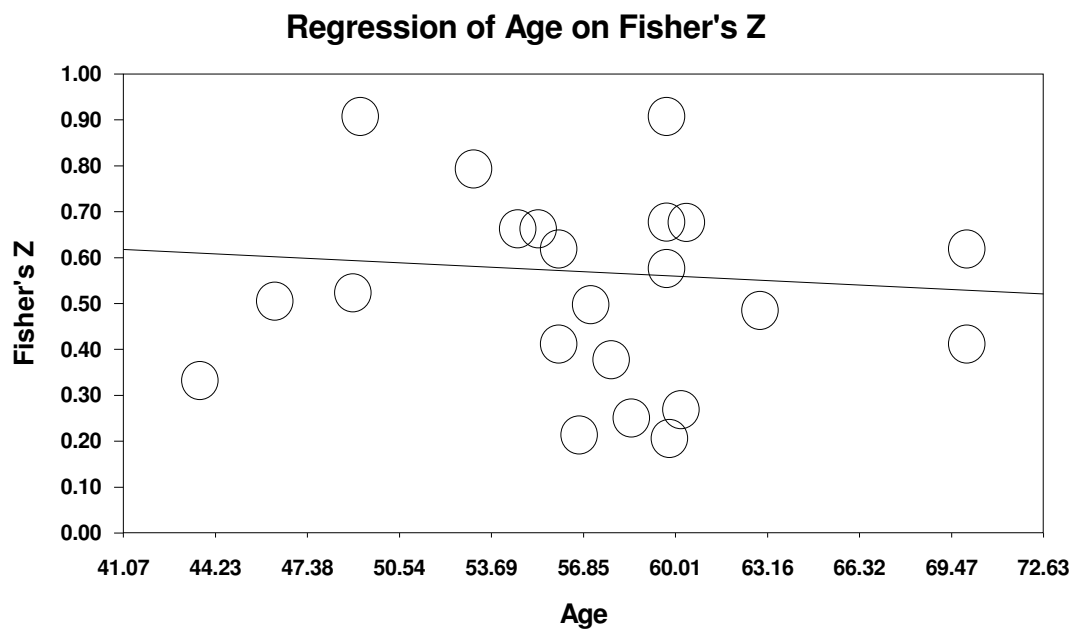


Cancer stage for SWB-QOL

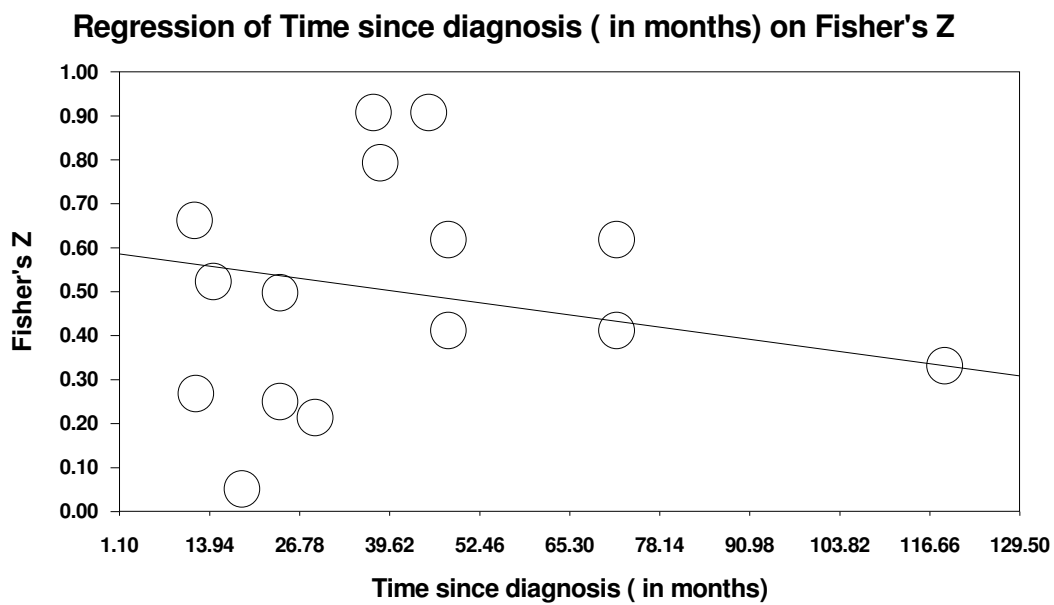
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Age for SWB-QOL

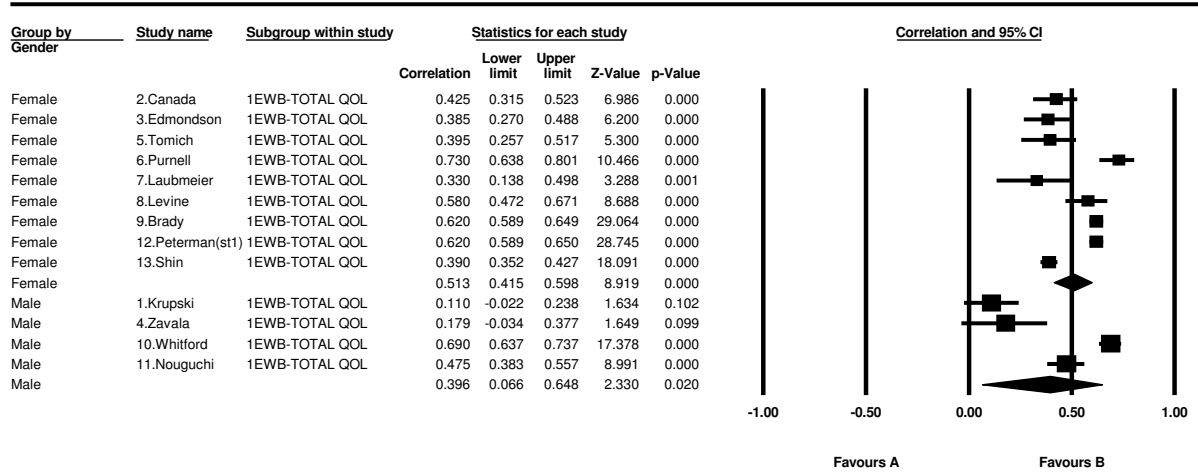


Time since diagnosis for SWB-QOL



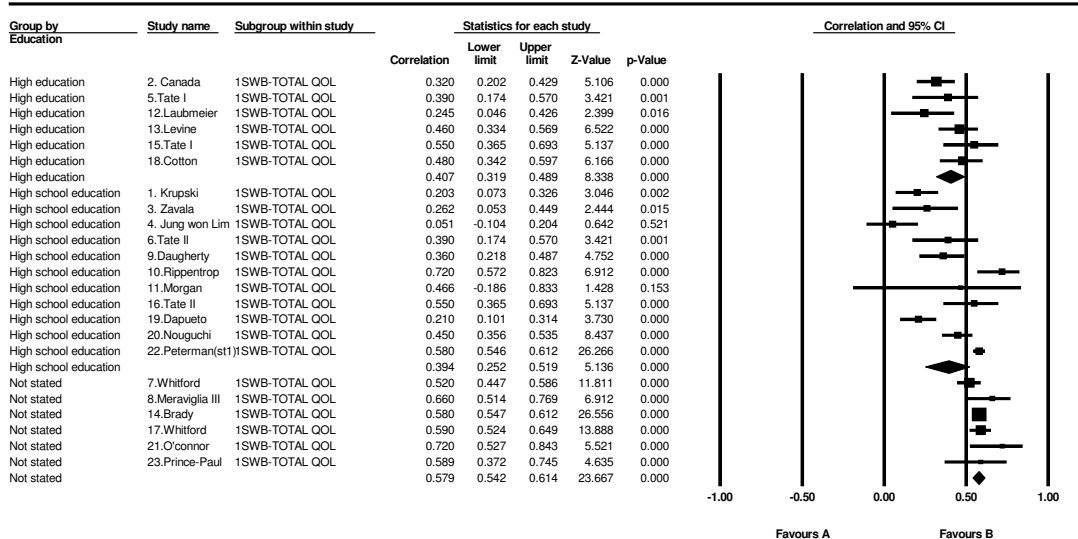
Gender for EWB-QOL

Meta Analysis



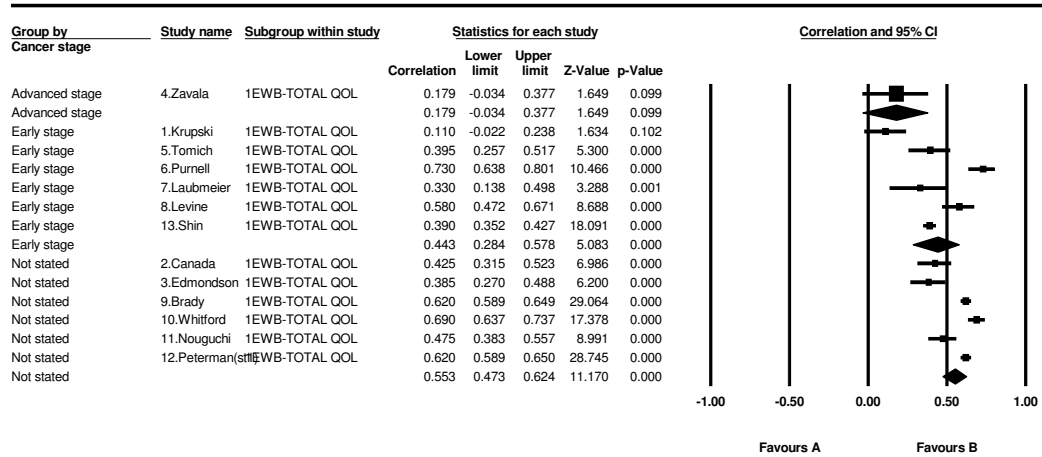
Education for EWB-QOL

Meta Analysis



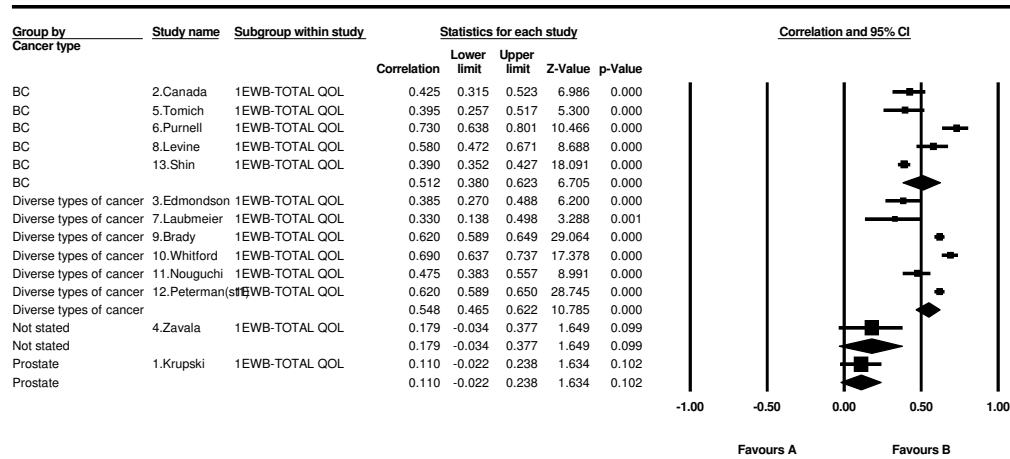
Cancer stage for EWB-QOL

Meta Analysis

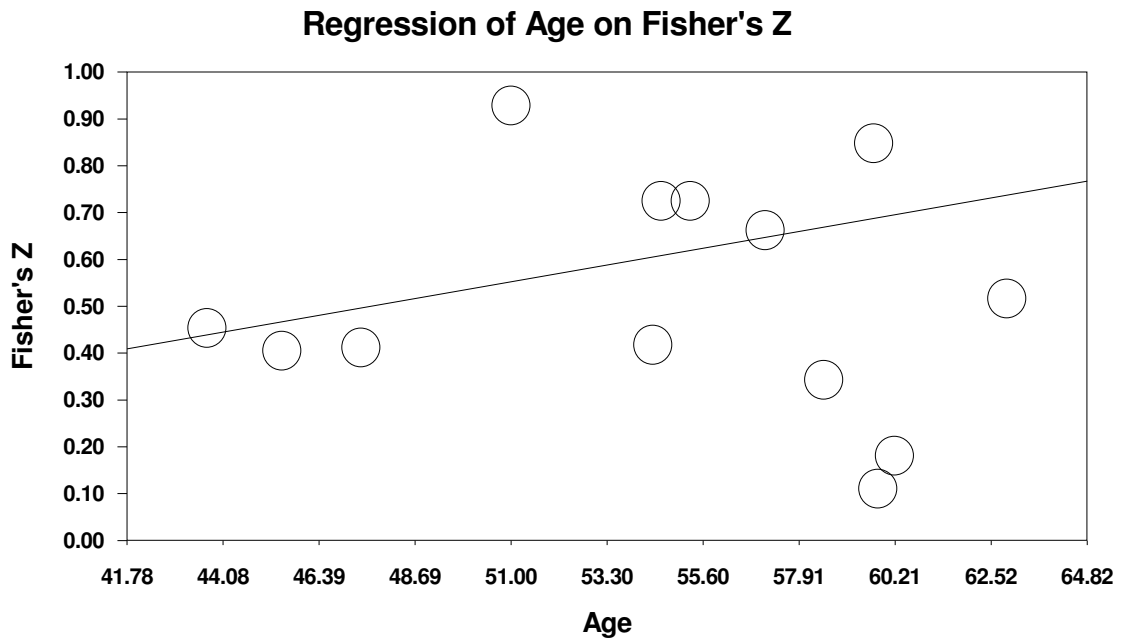


Cancer type for EWB-QOL

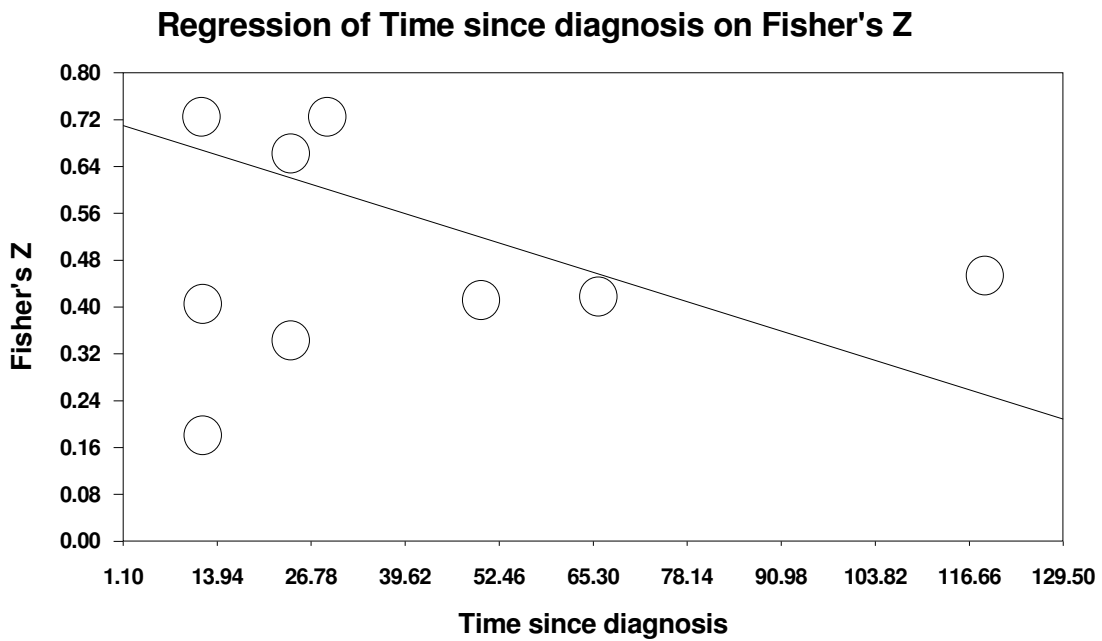
Meta Analysis



Age for EWB-QOL

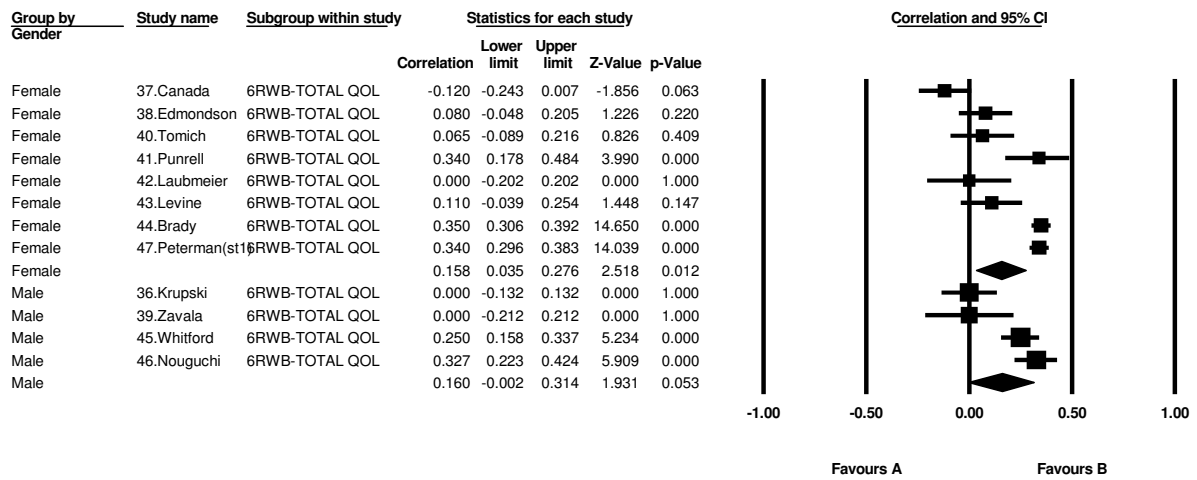


Time since diagnosis for EWB-QOL



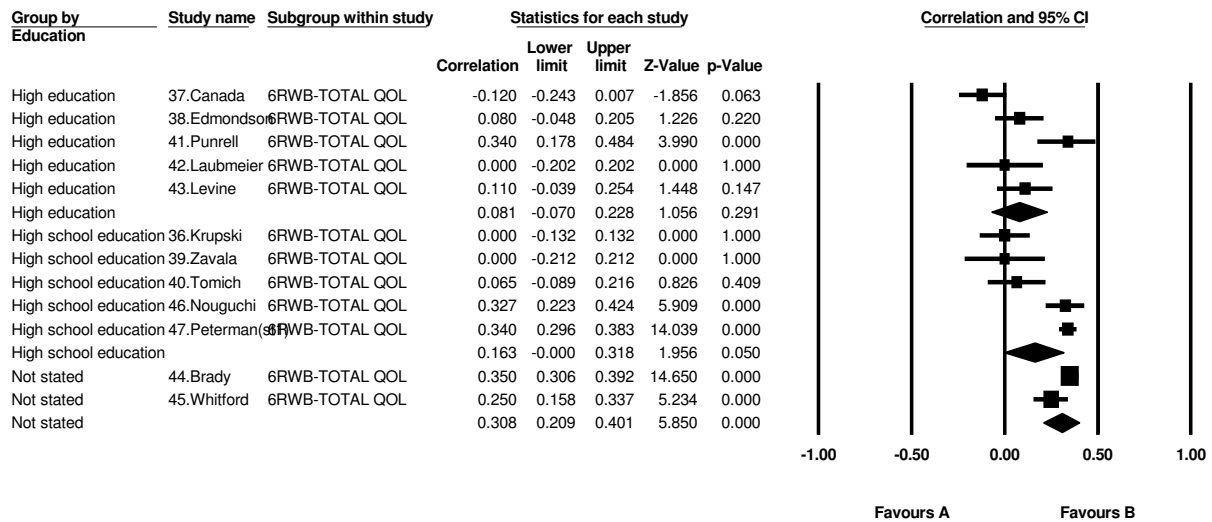
Gender for RWB-QOL

Meta Analysis



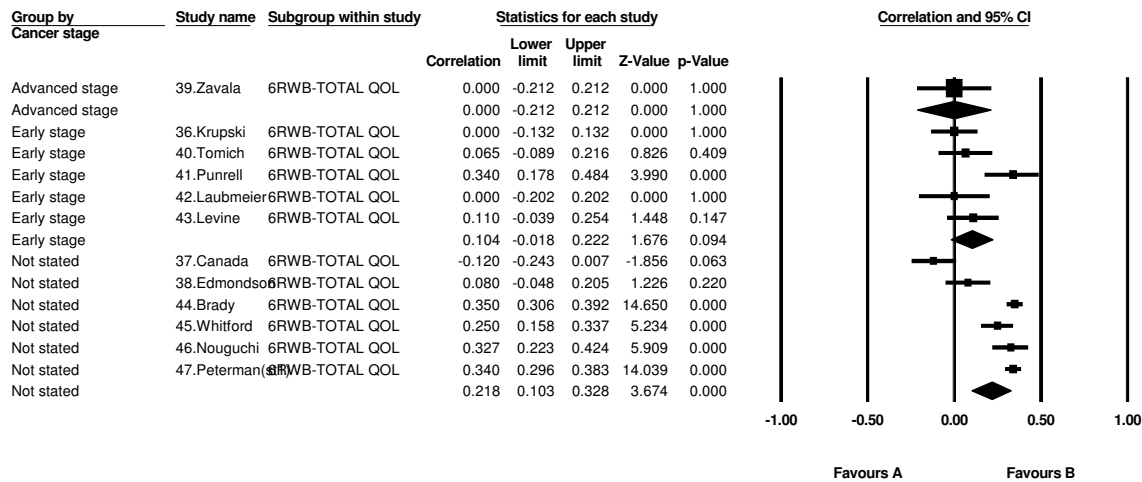
Education for RWB-QOL

Meta Analysis



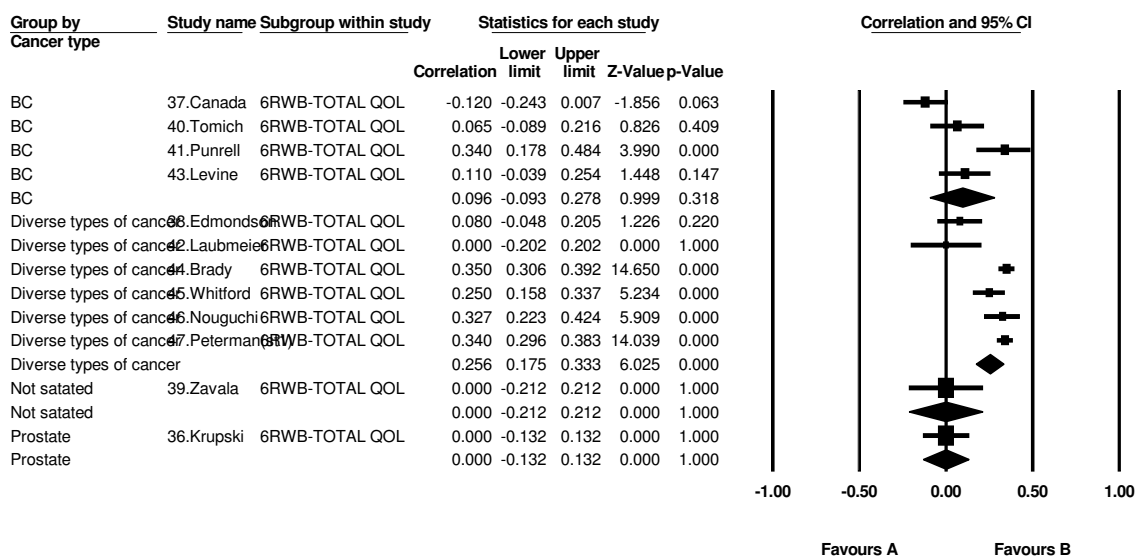
Cancer stage for RWB-QOL

Meta Analysis

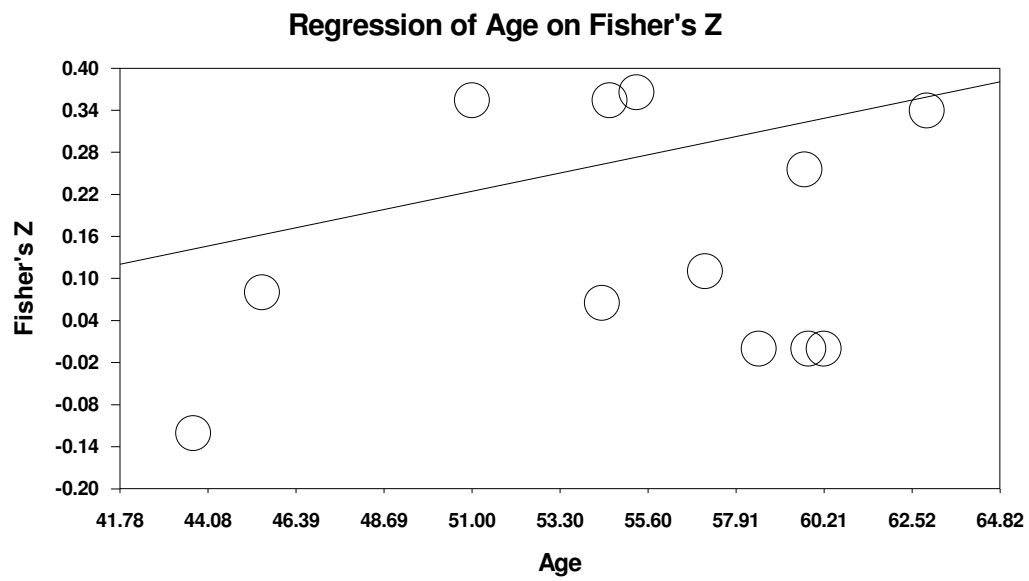


Cancer type for RWB-QOL

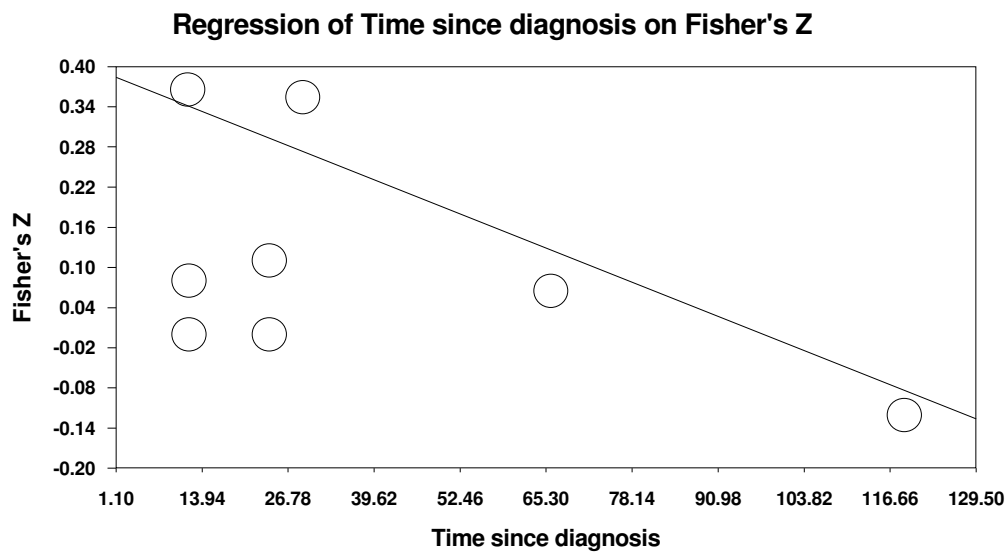
Meta Analysis



Age for RWB-QOL

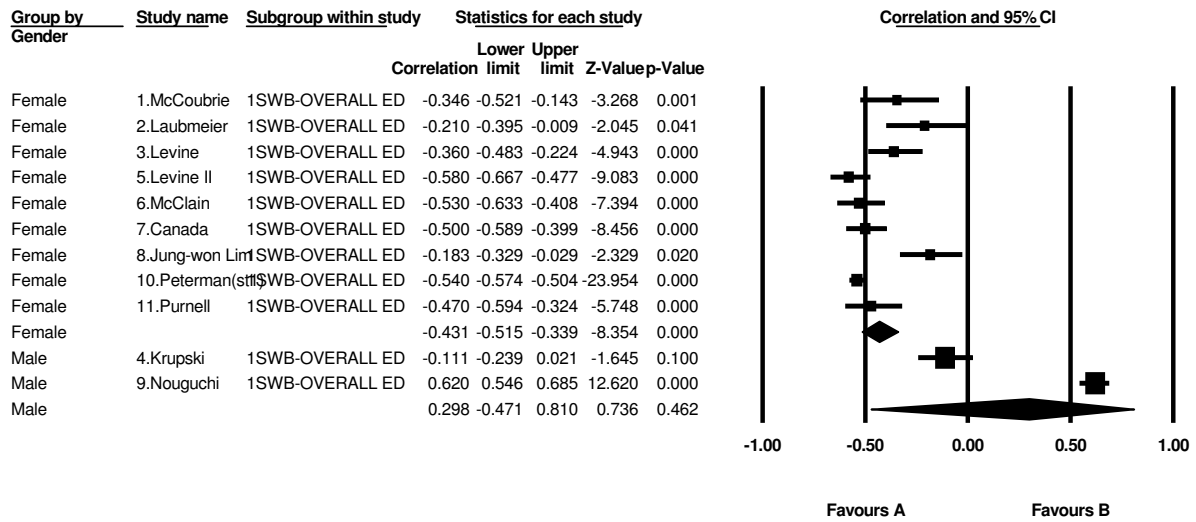


Time since diagnosis for RWB-QOL



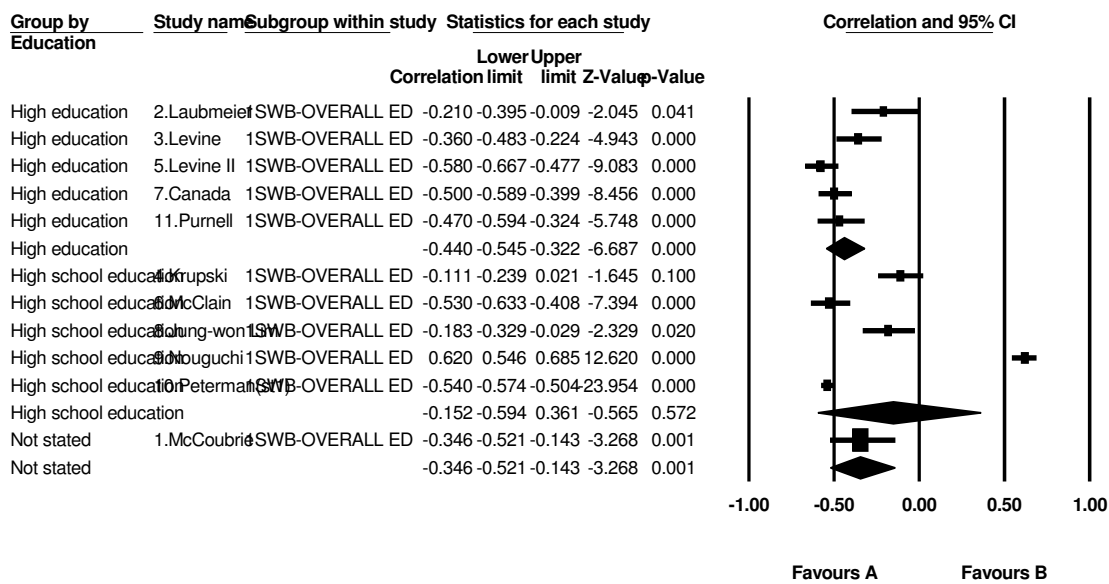
Gender for SWB-OVERALL ED

Meta Analysis



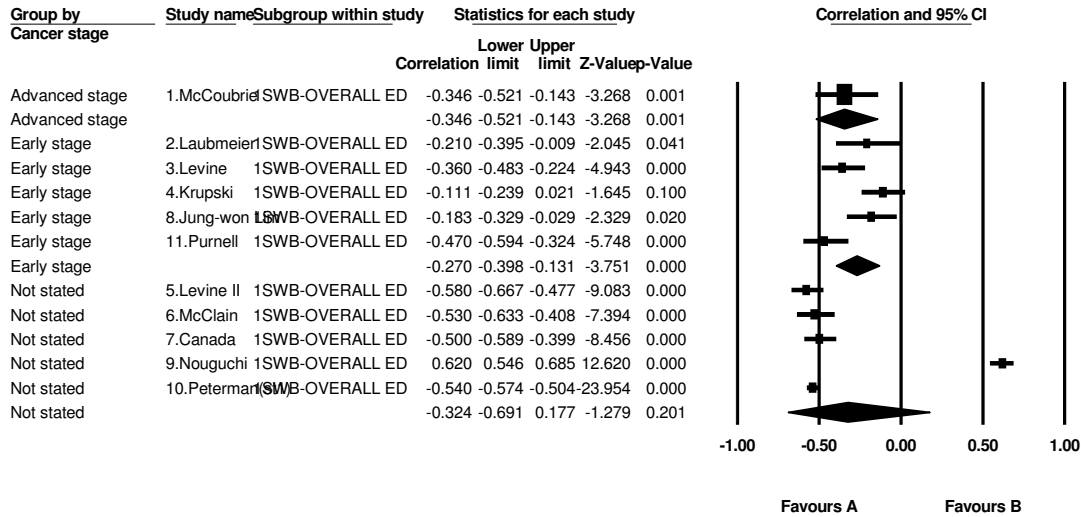
Education for SWB-OVERALL ED

Meta Analysis



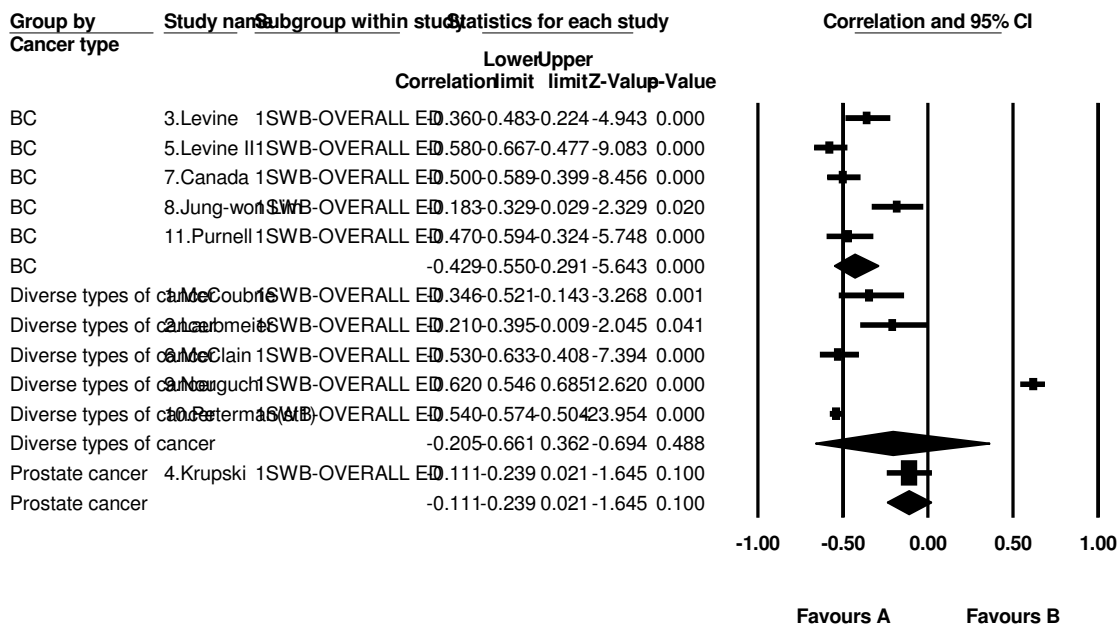
Cancer stage for SWB-OVERALL ED

Meta Analysis

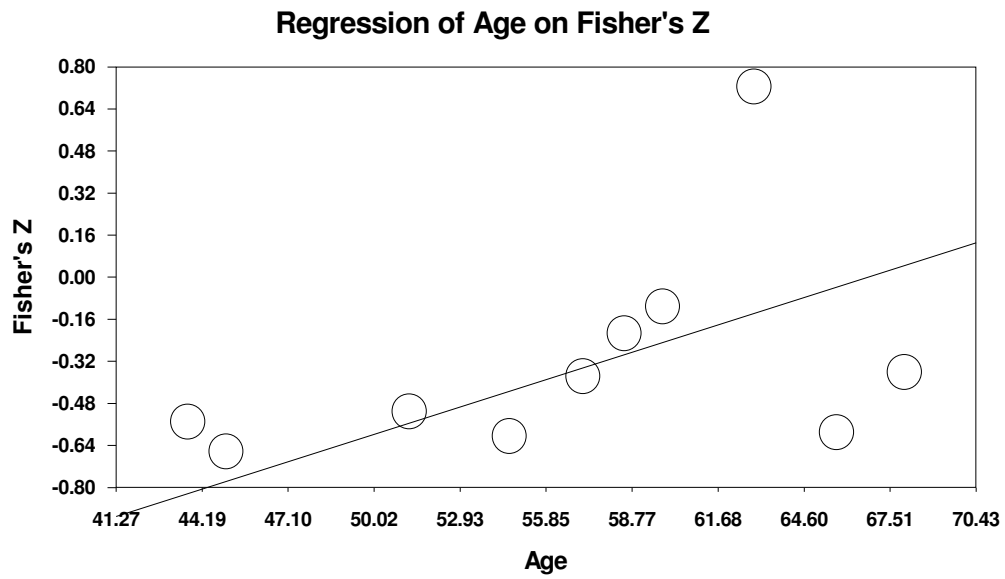


Cancer type for SWB-OVERALL ED

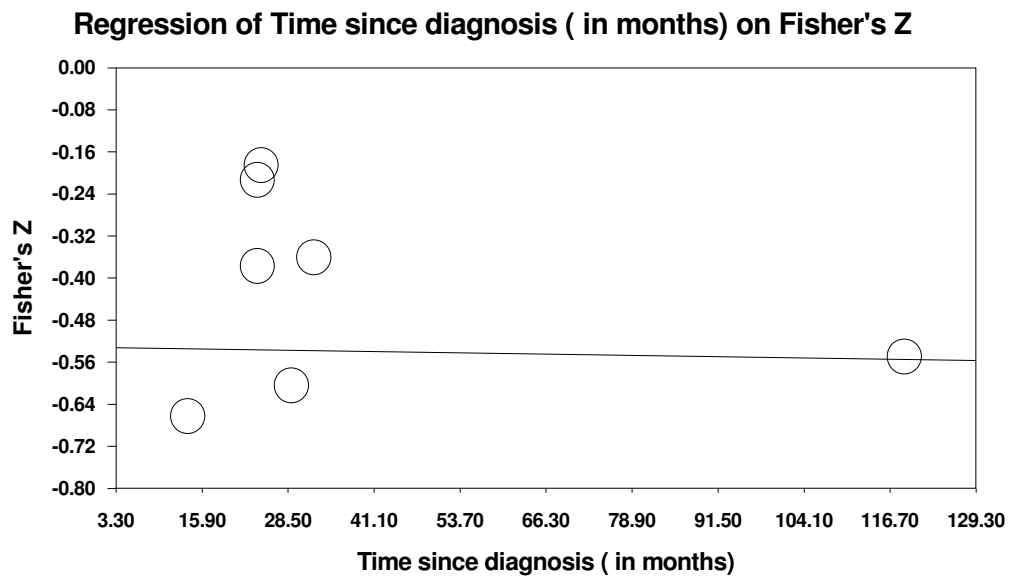
Meta Analysis



Age for SWB-OVERALL ED

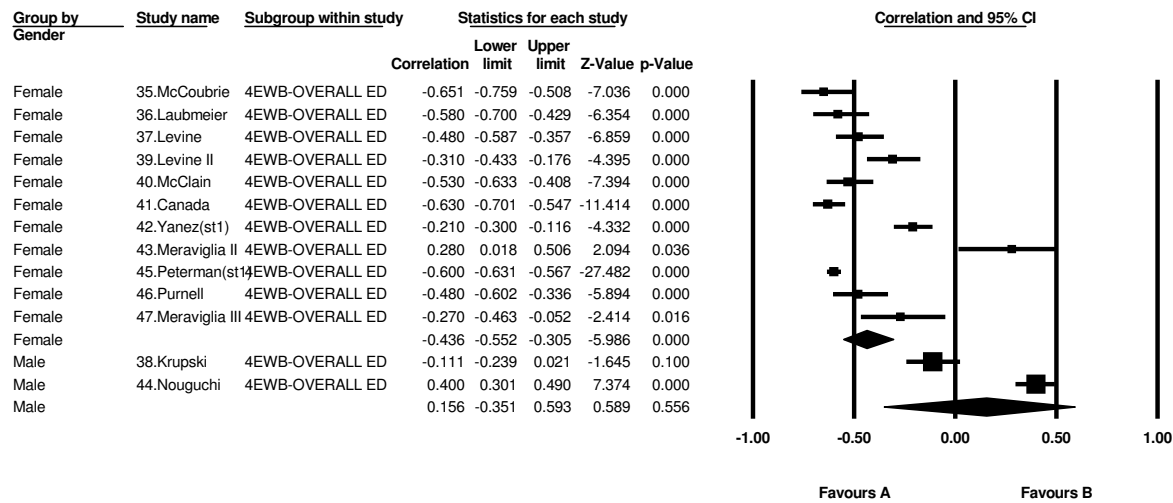


Time since diagnosis for SWB-OVERALL ED



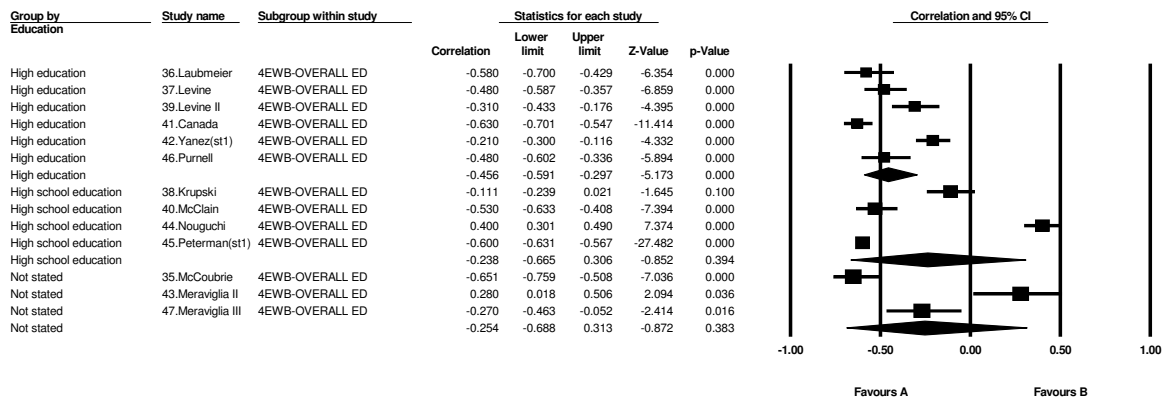
Gender for EWB-OVERALL ED

Meta Analysis



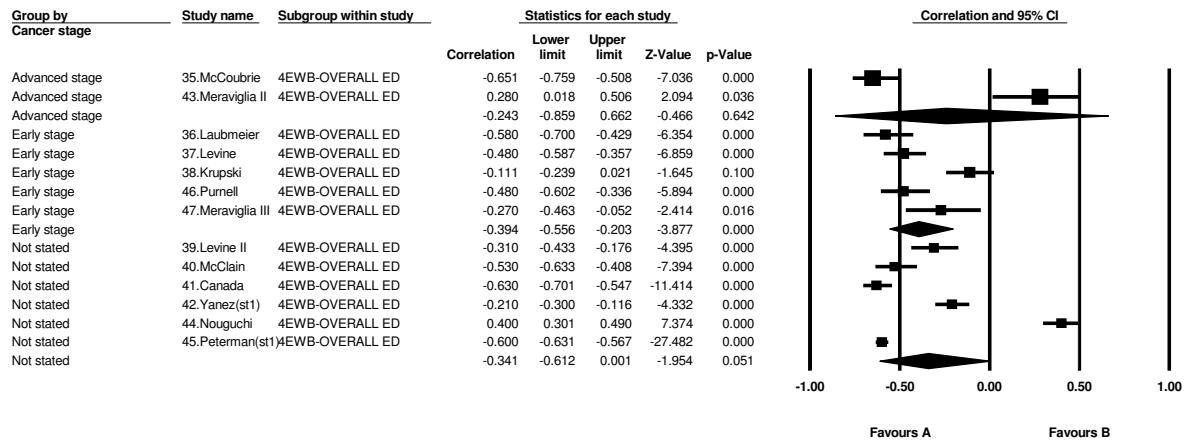
Education for EWB-OVERALL ED

Meta Analysis



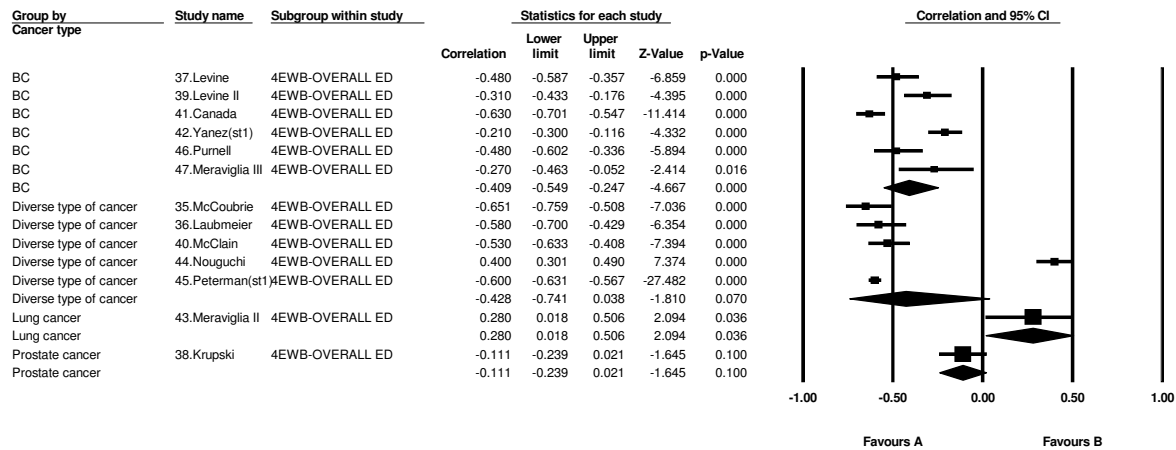
Cancer stage for EWB-OVERALL ED

Meta Analysis



Cancer type for EWB-OVERALL ED

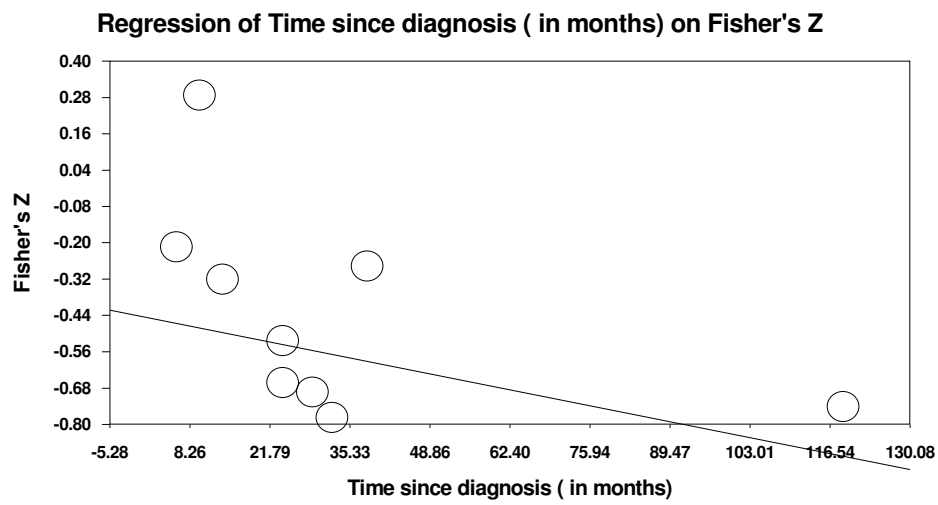
Meta Analysis



Age for EWB-OVERALL ED

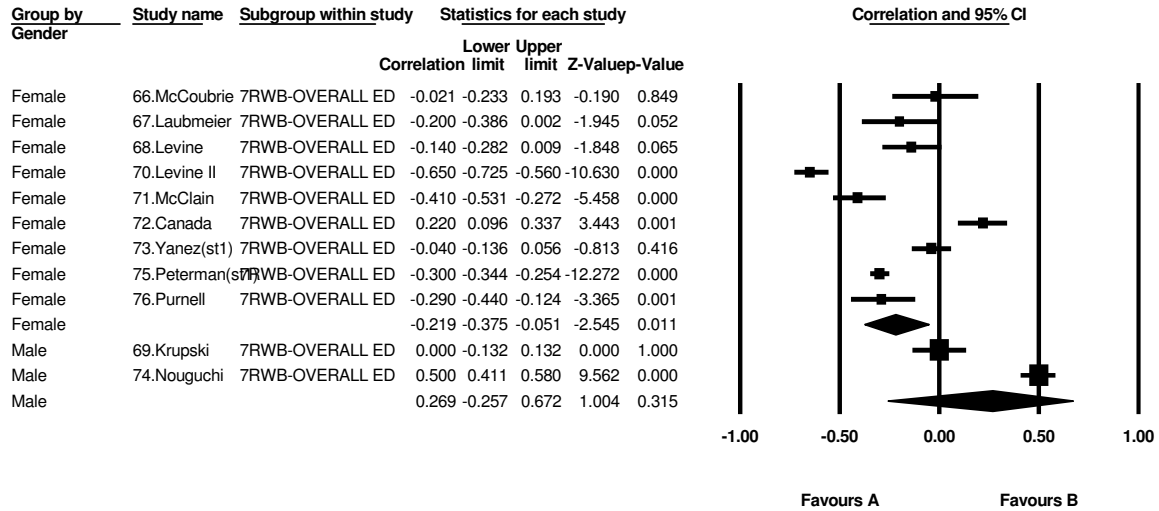


Time since diagnosis for EWB-OVERALL ED



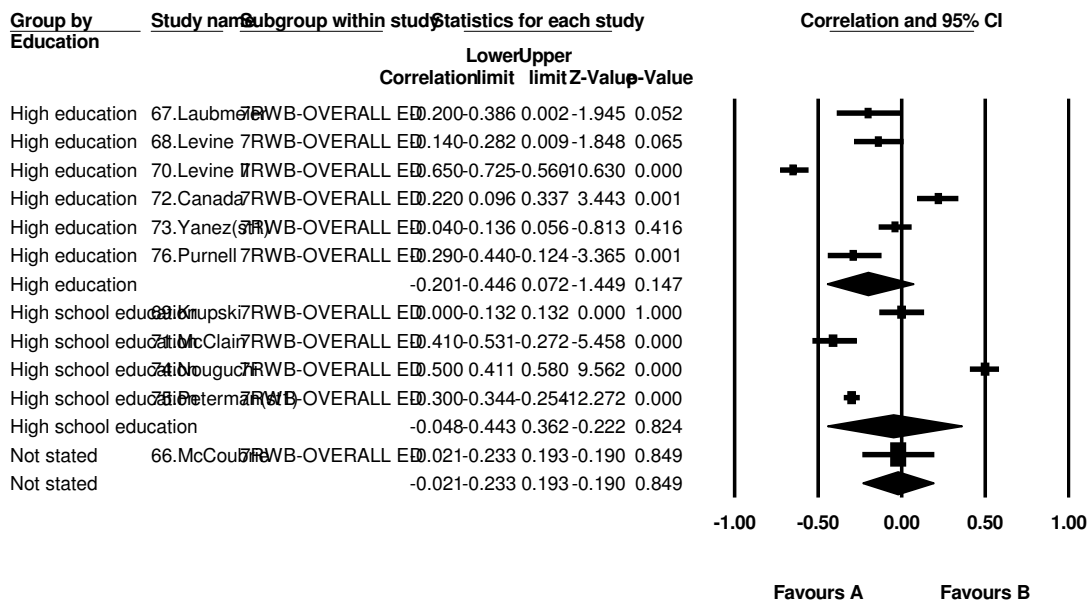
Gender for RWB-OVERALL ED

Meta Analysis



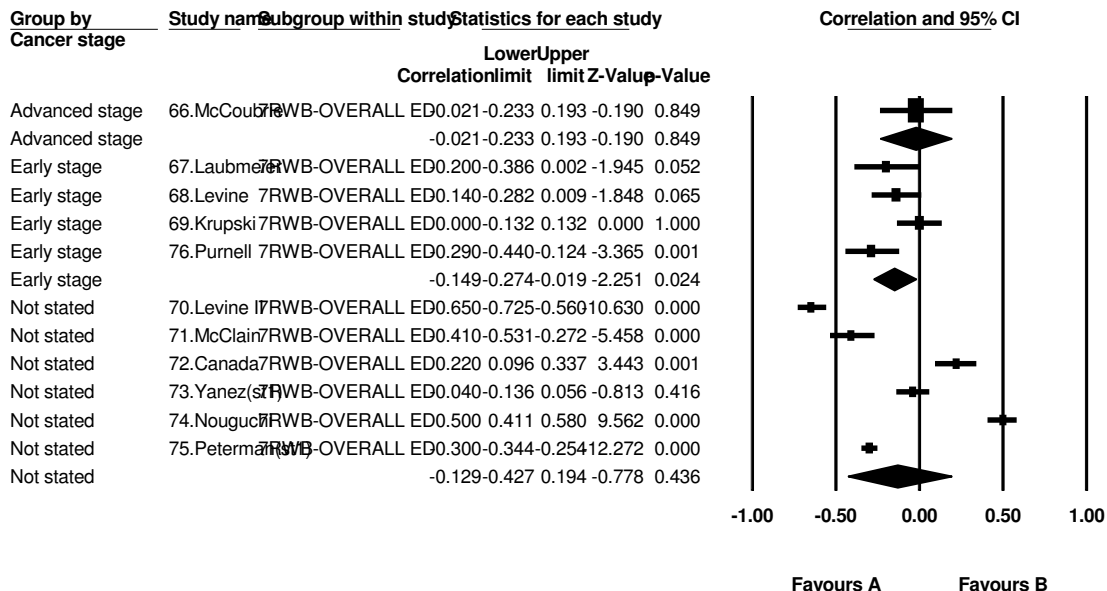
Education for RWB-OVERALL ED

Meta Analysis



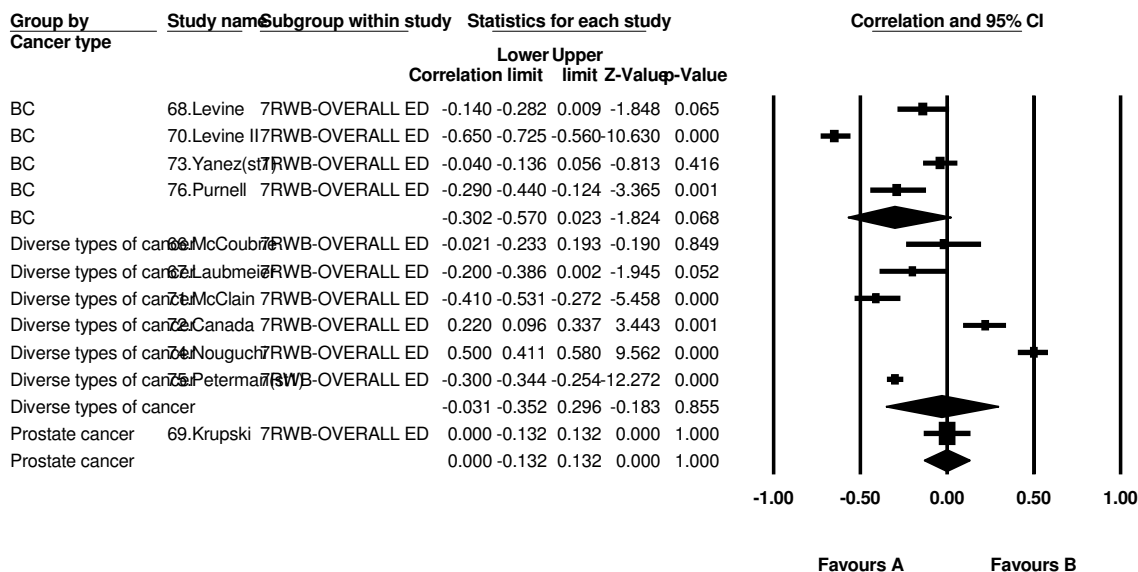
Cancer stage for RWB-OVERALL ED

Meta Analysis

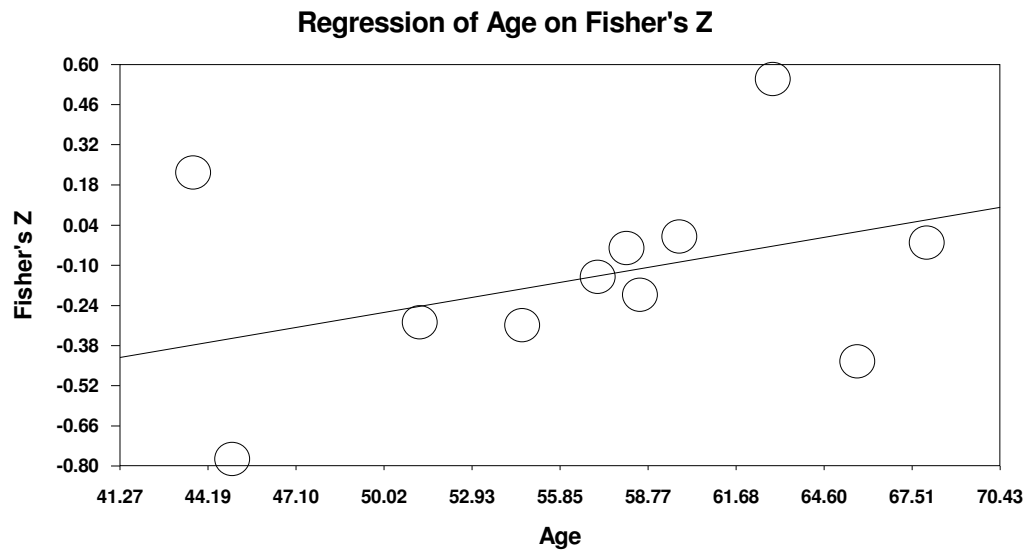


Cancer type for RWB-OVERALL ED

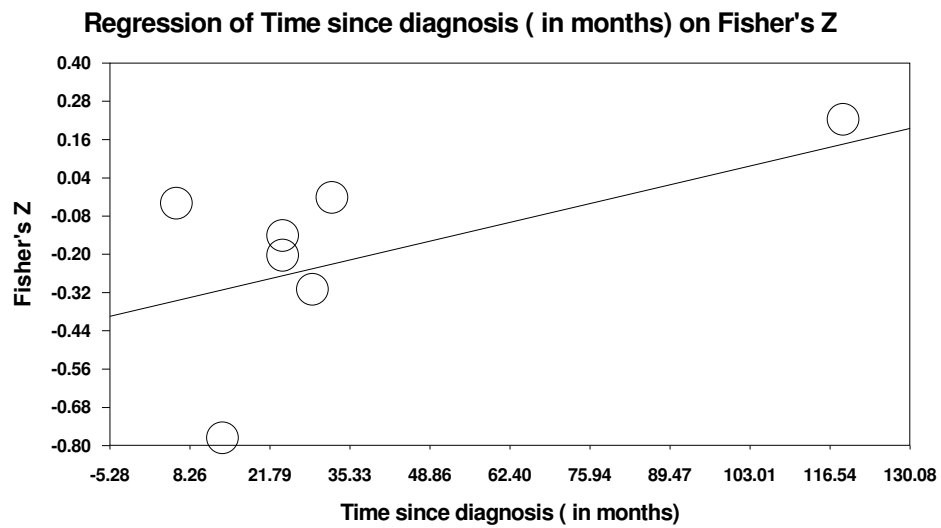
Meta Analysis



Age for RWB-OVERALL ED

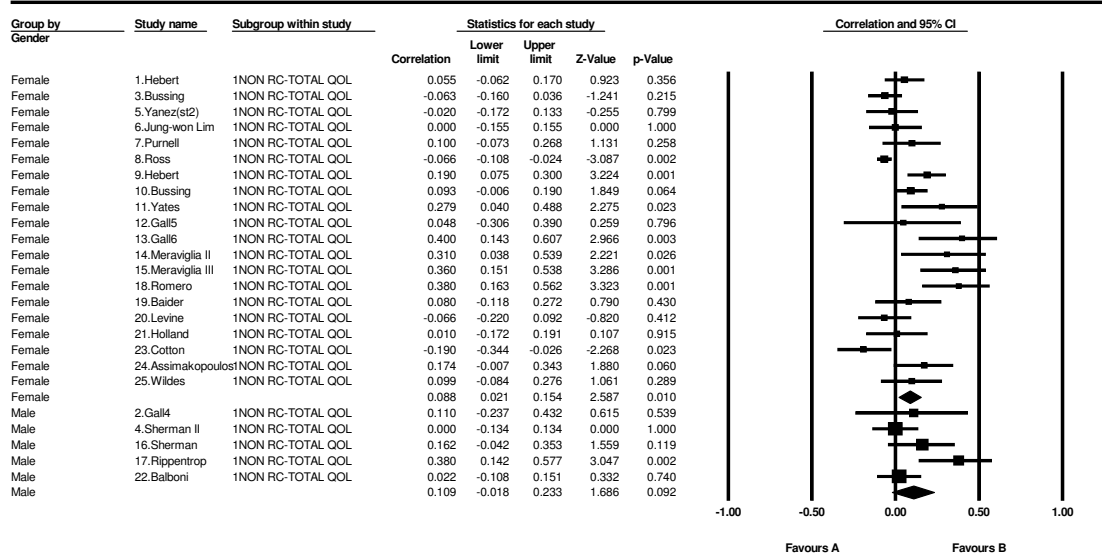


Time since diagnosis for RWB-OVERALL ED



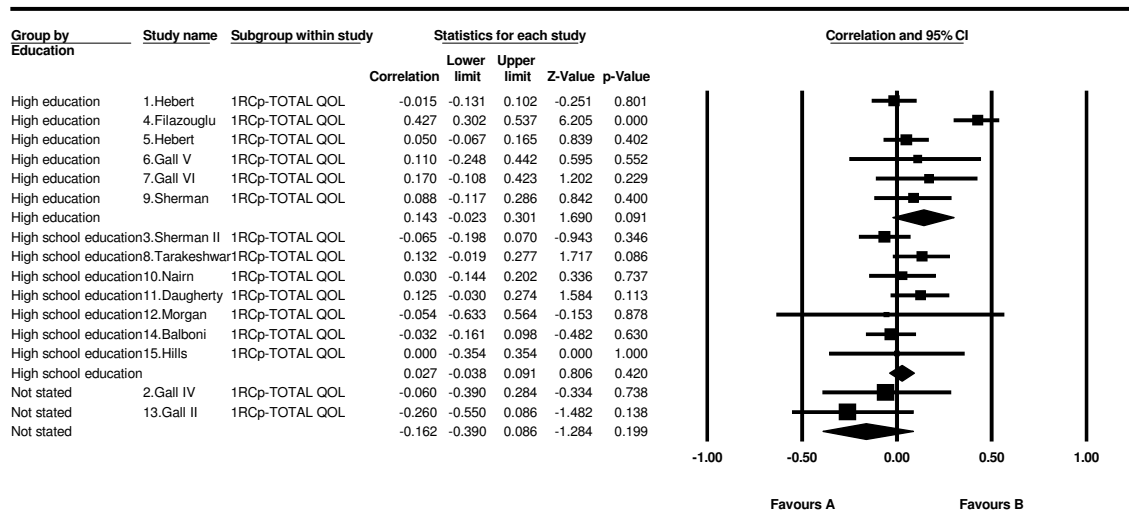
Gender for general religiousness¹⁰- quality of life

Meta Analysis



Education for general religiousness – quality of life

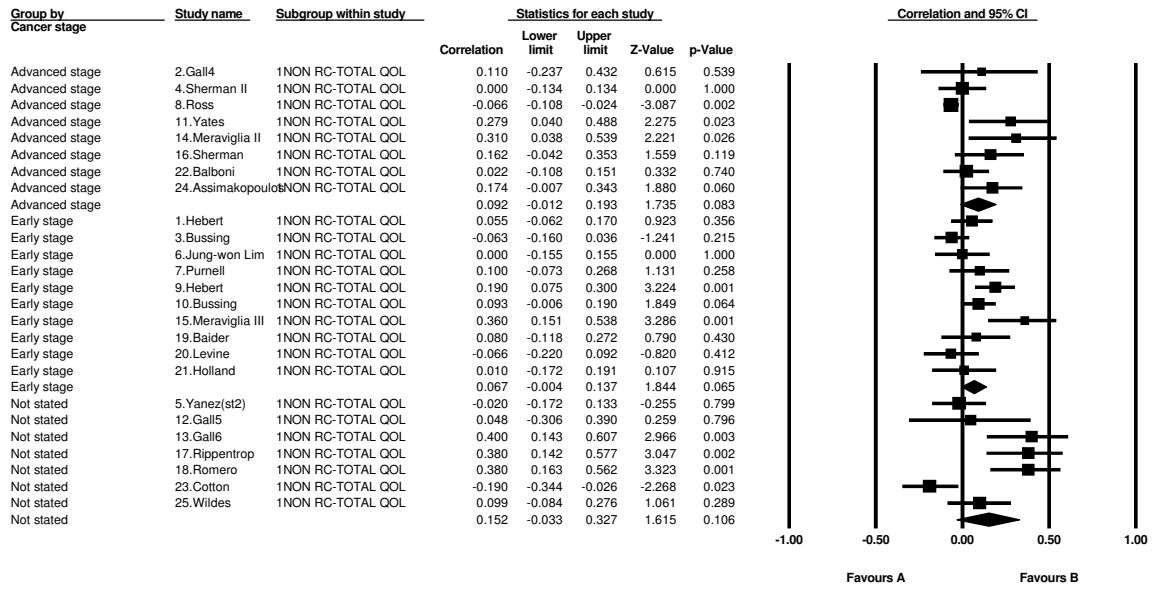
Meta Analysis



¹⁰ General religiousness can be also referred to as 'non religious coping' (NON RC), and that is how it is presented in the present graphs.

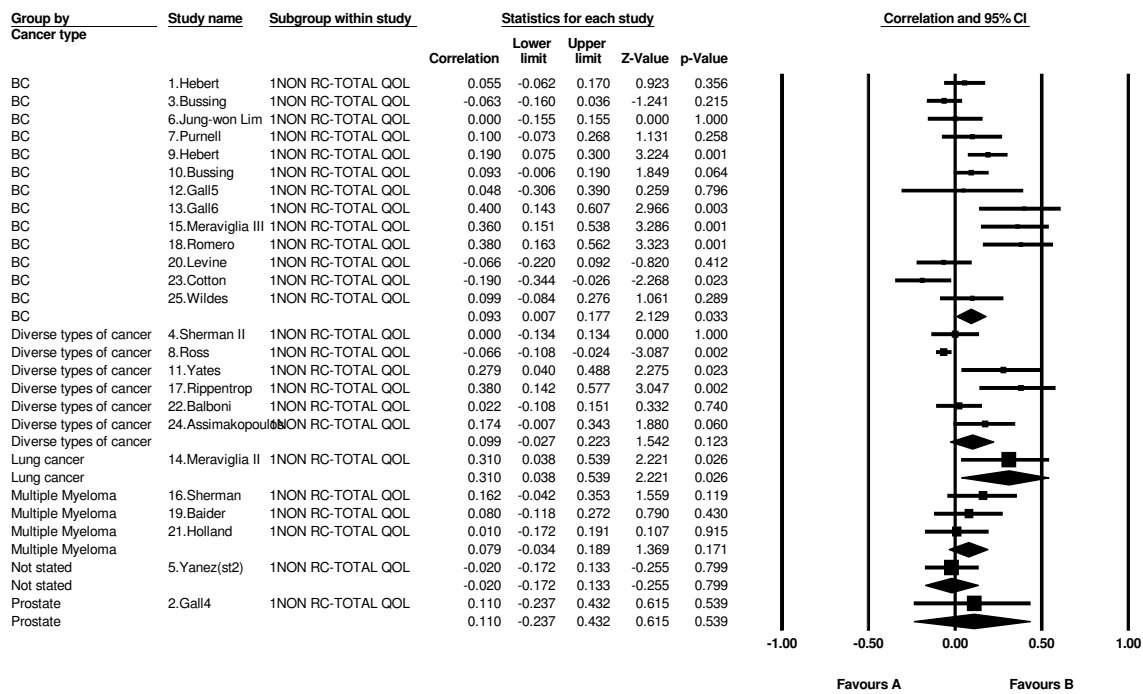
Cancer stage for general religiousness - quality of life

Meta Analysis



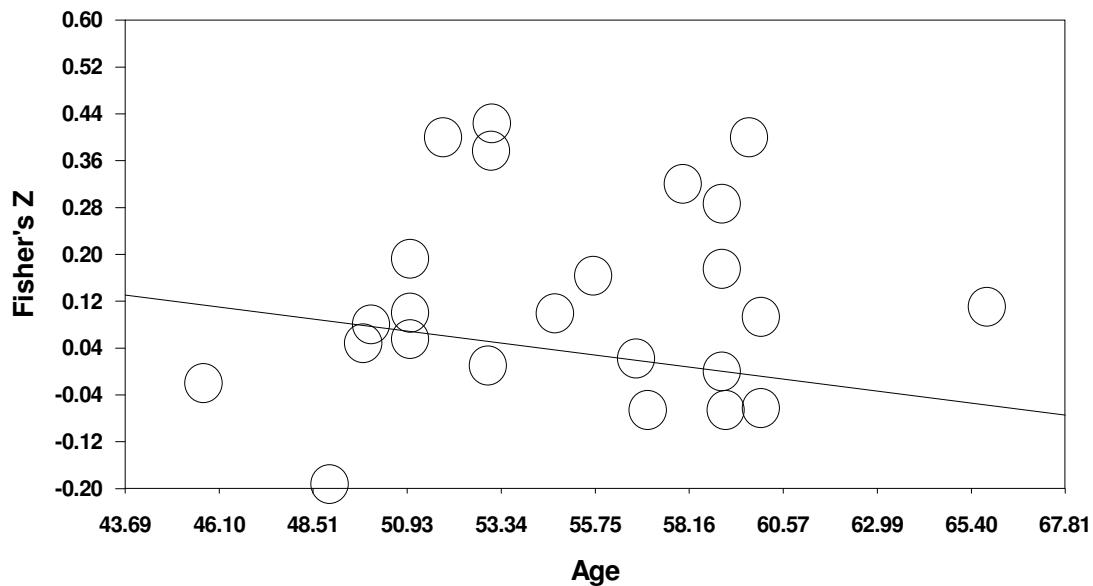
Cancer type for general religiousness – quality of life

Meta Analysis

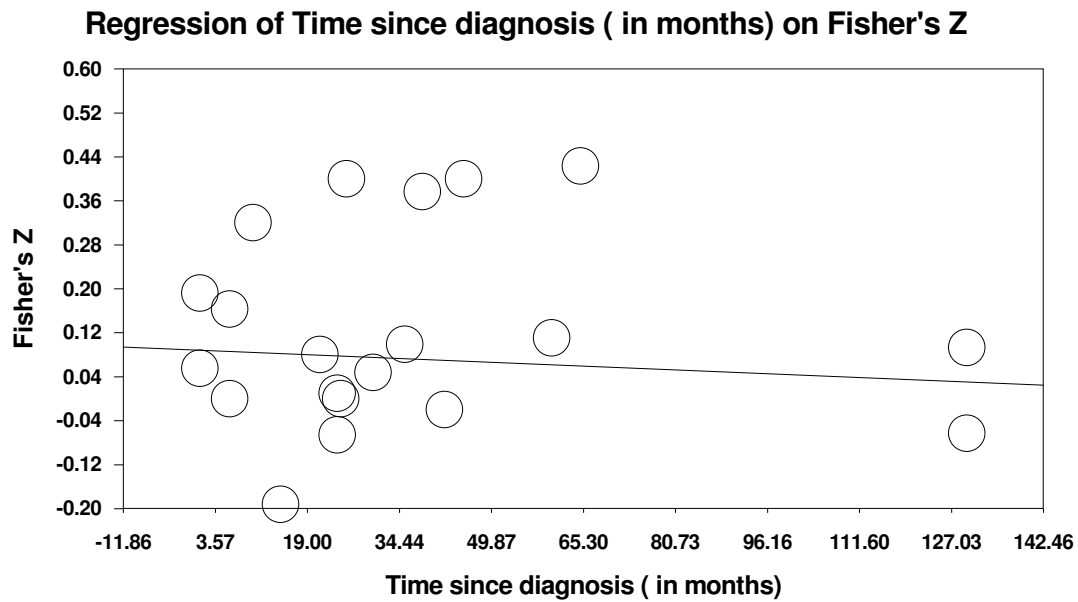


Age for general religiousness – quality of life

Regression of Age on Fisher's Z

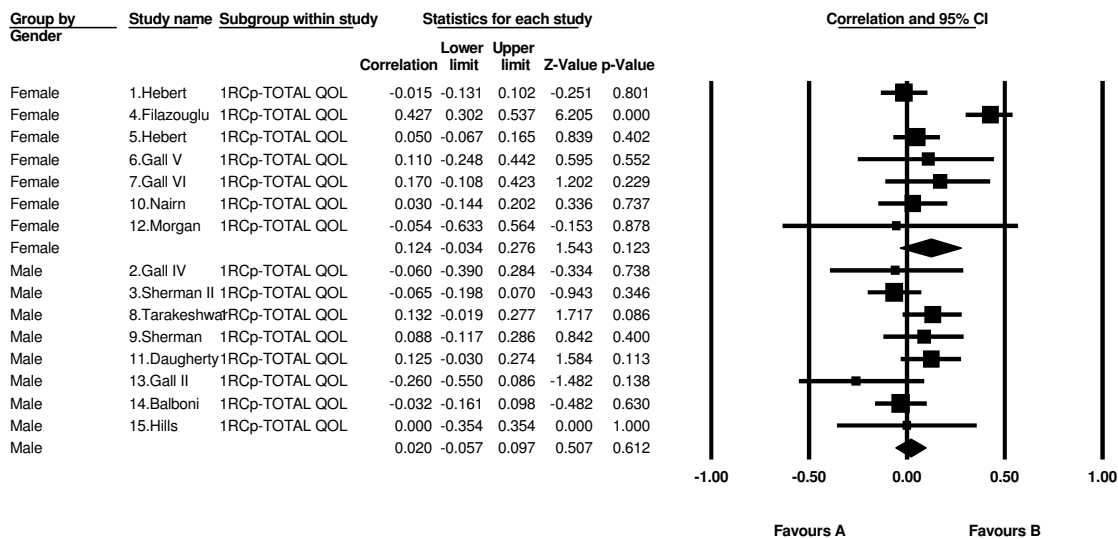


Time since diagnosis for general religiousness – quality of life



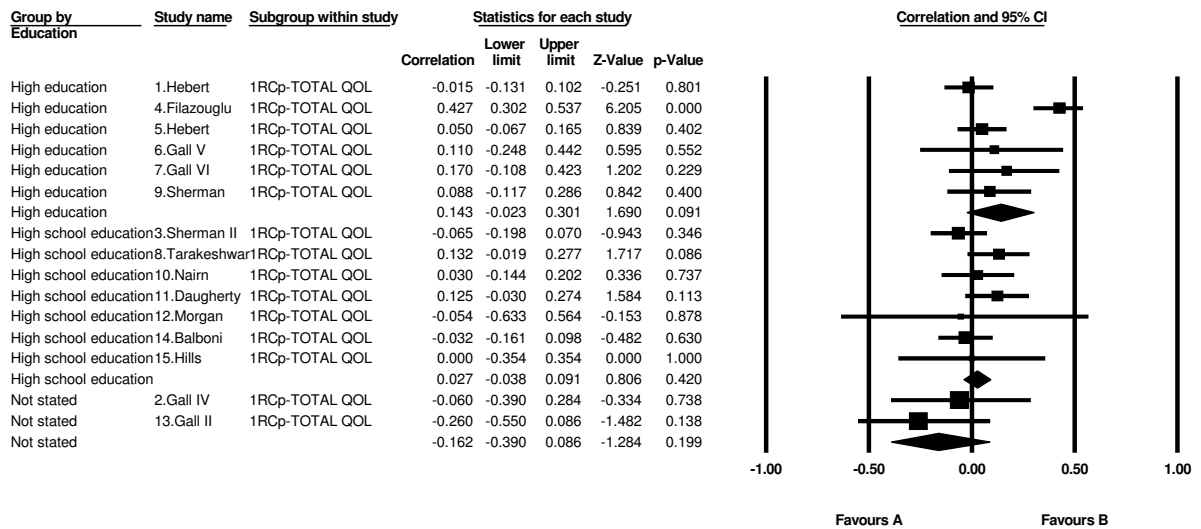
Gender for RCp-QOL

Meta Analysis



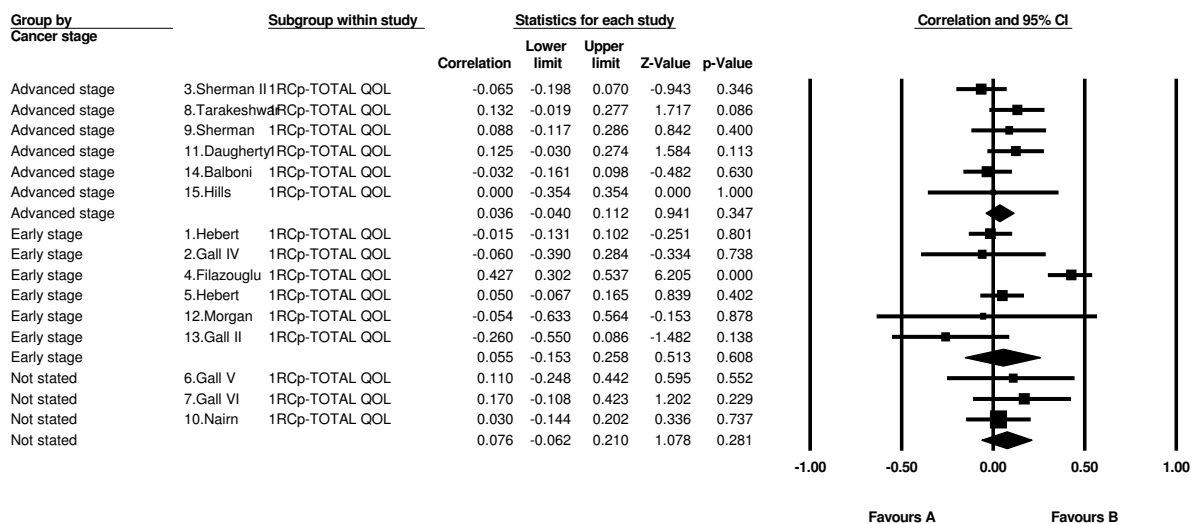
Education for RCp-QOL

Meta Analysis



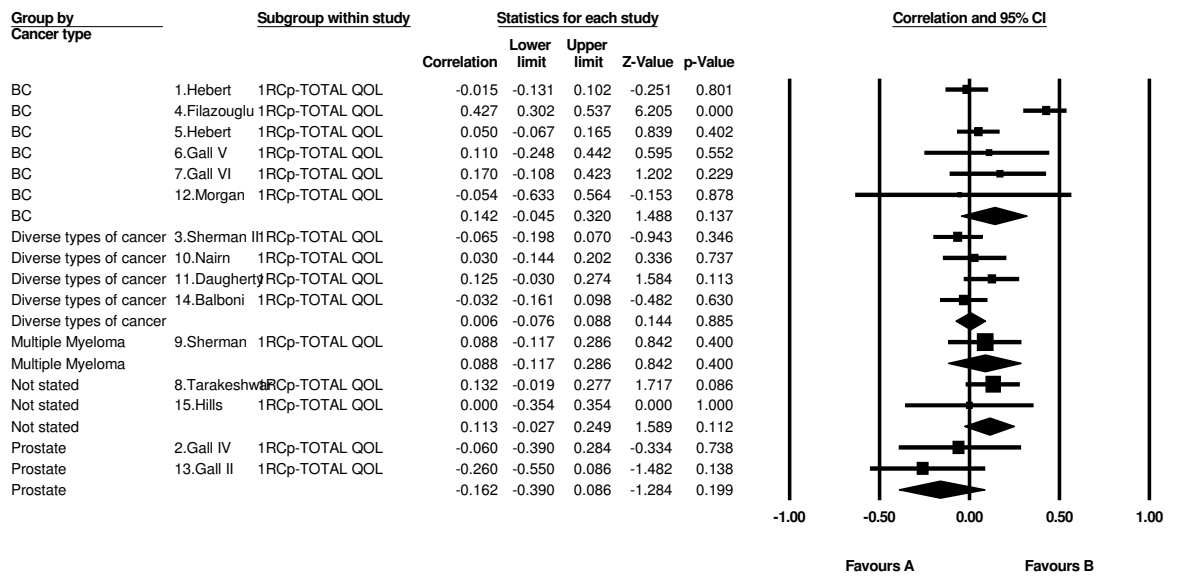
Cancer stage for RCp-QOL

Meta Analysis



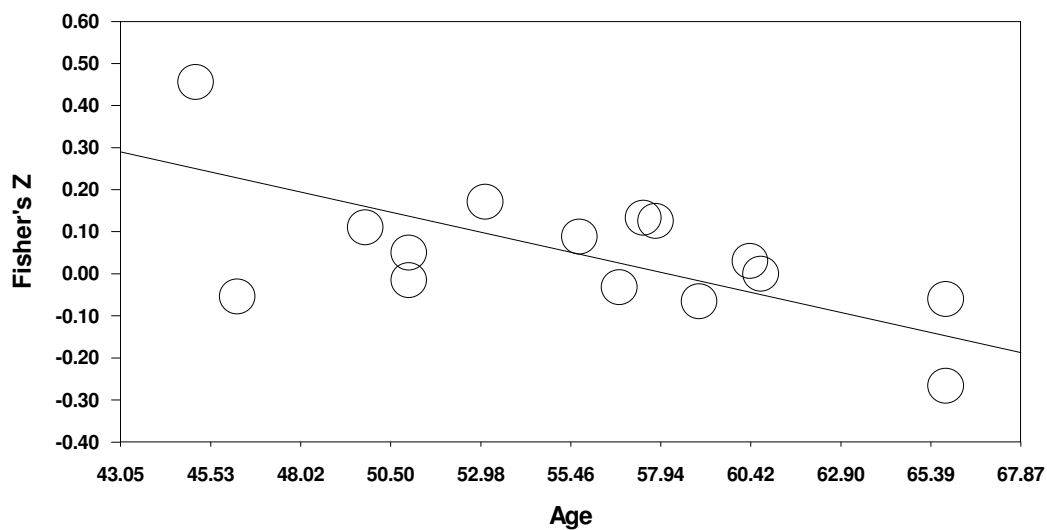
Cancer type for RCp-QOL

Meta Analysis

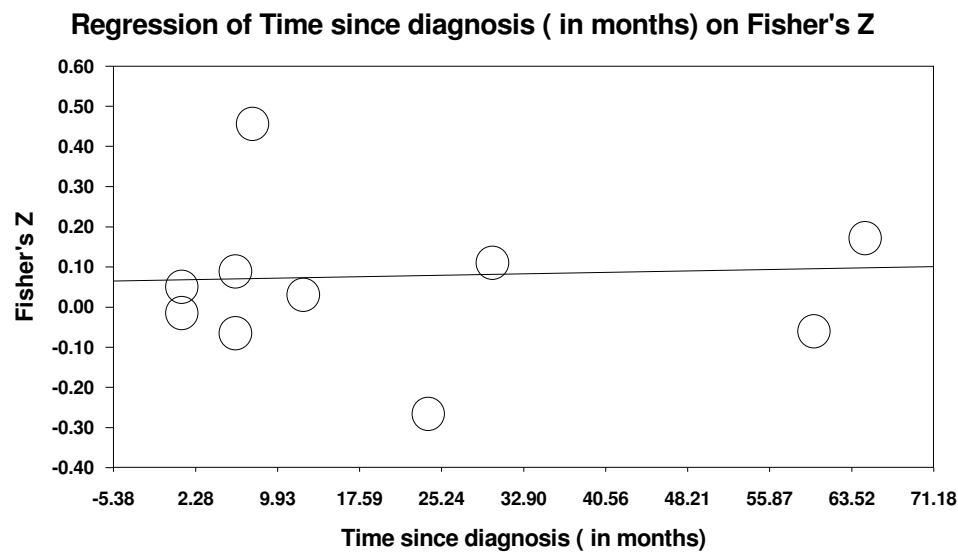


Age for RCp-QOL

Regression of Age on Fisher's Z

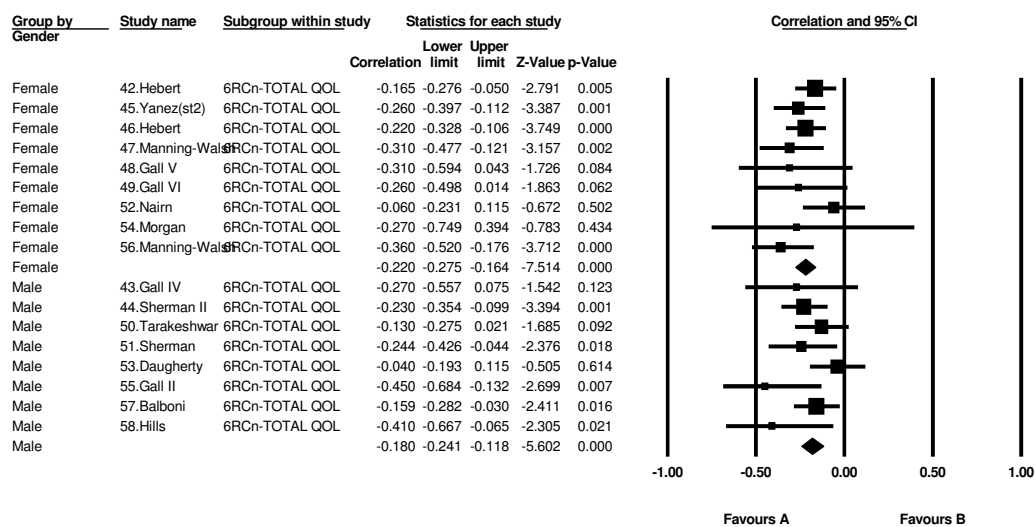


Time since diagnosis RCp-QOL



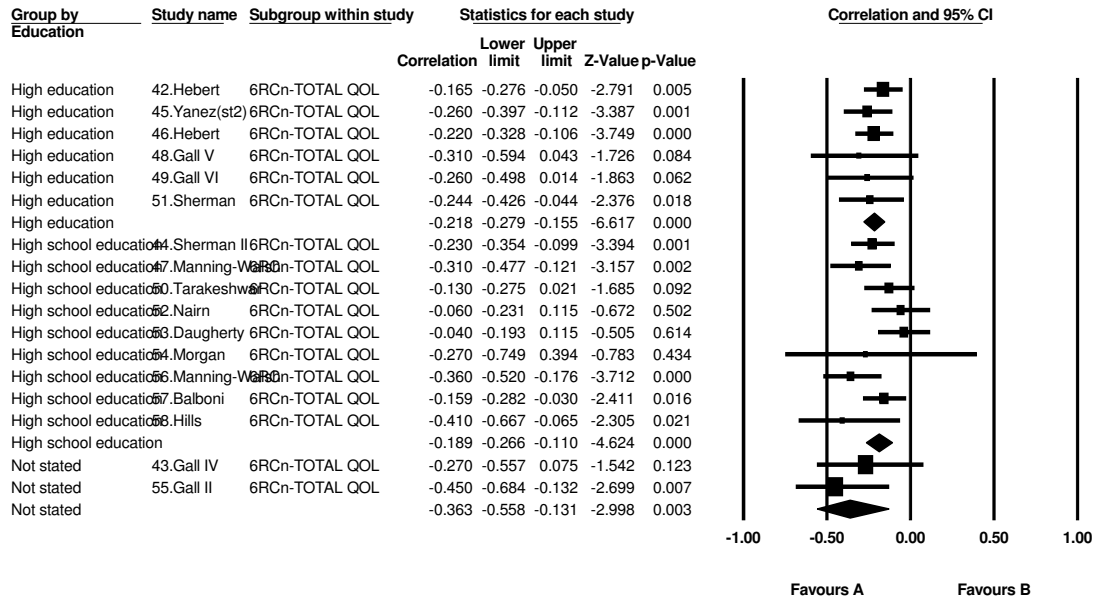
Gender for RCn-QOL

Meta Analysis



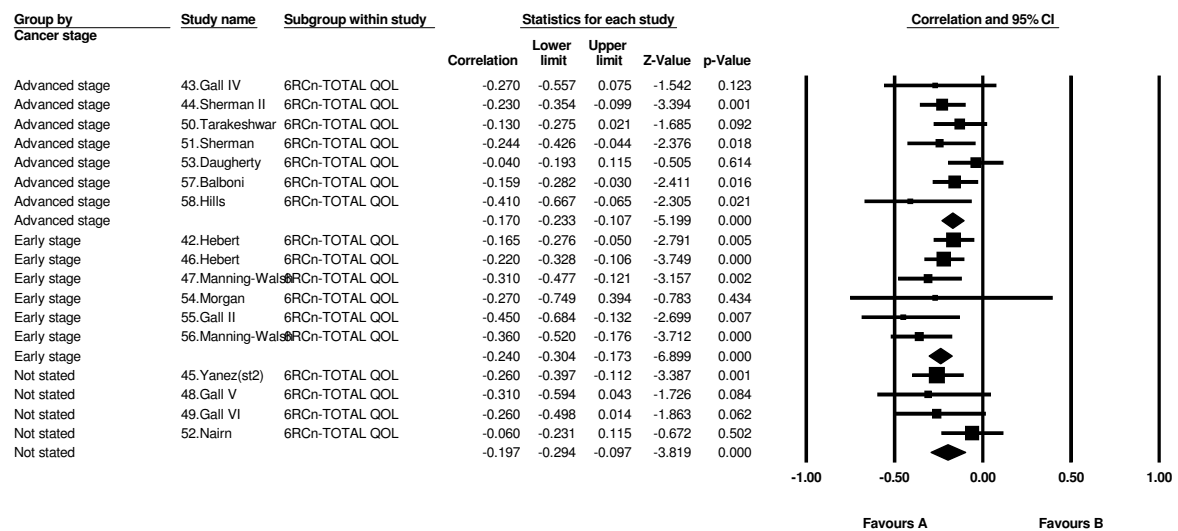
Education for RCn-QOL

Meta Analysis



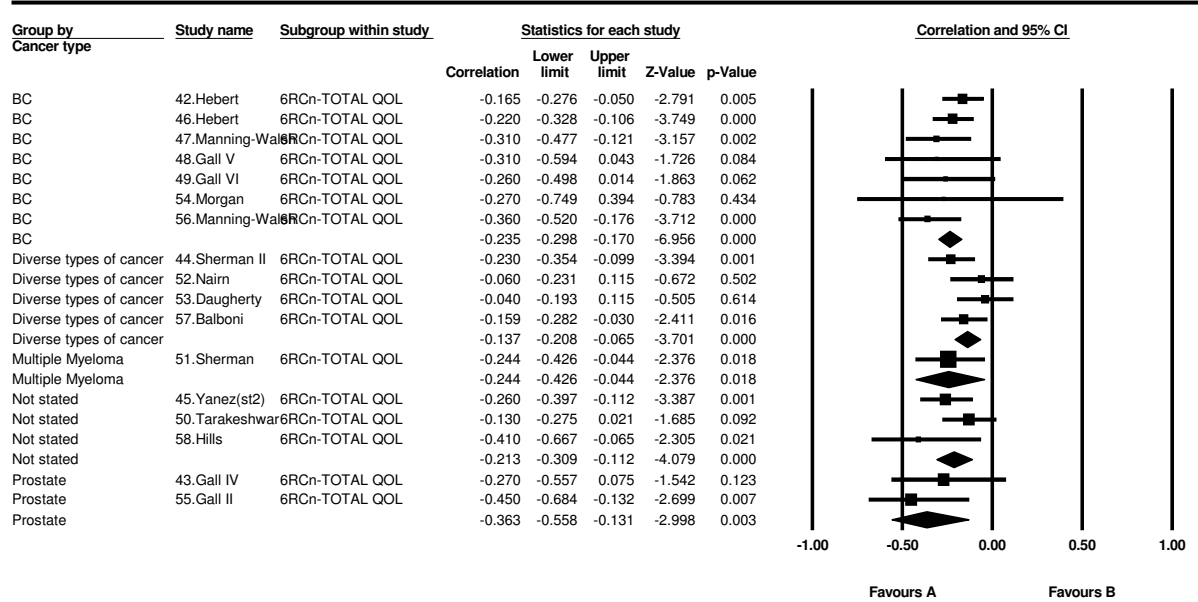
Cancer stage for Rcn-QOL

Meta Analysis

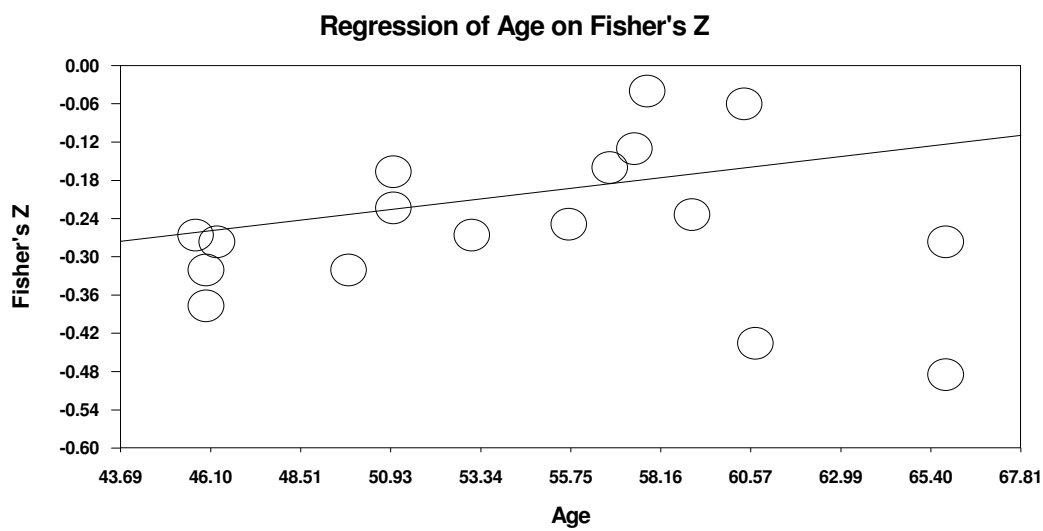


Cancer type for RCn-QOL

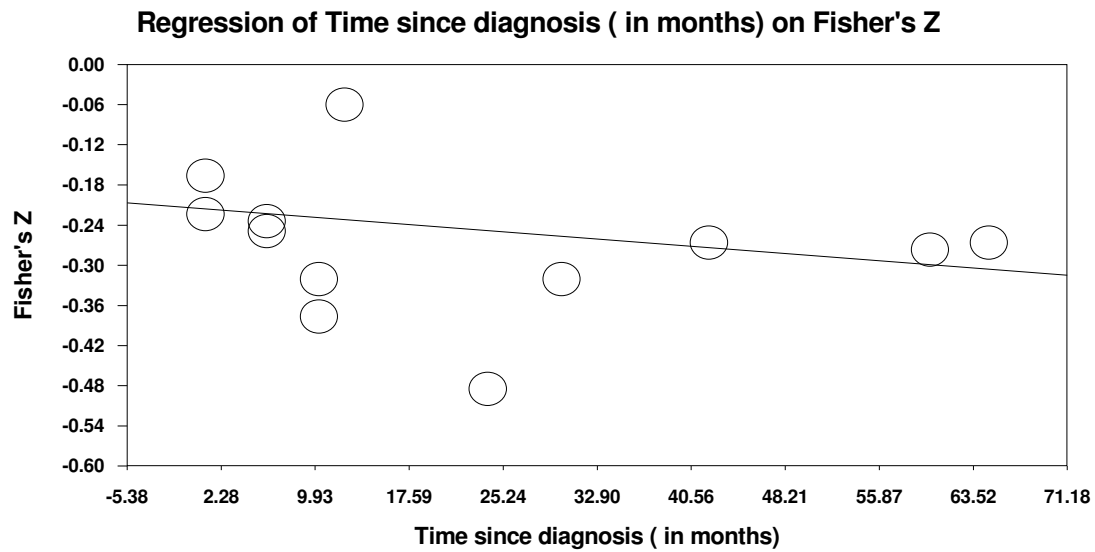
Meta Analysis



Age for RCn-QOL

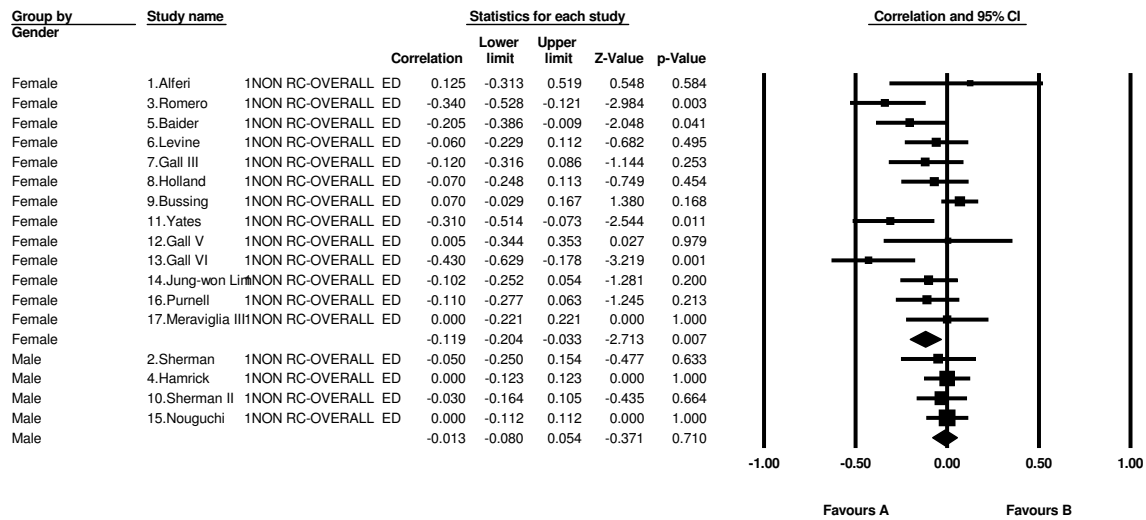


Time since diagnosis for RCn-QOL



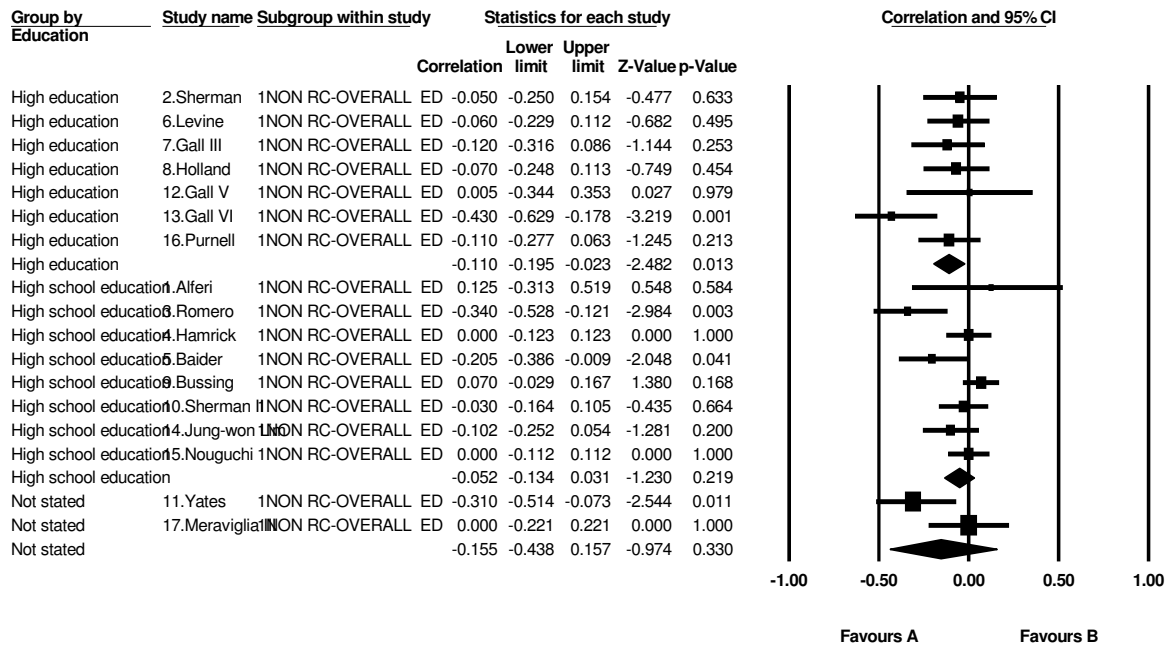
Gender for general religiousness – overall emotional distress

Meta Analysis



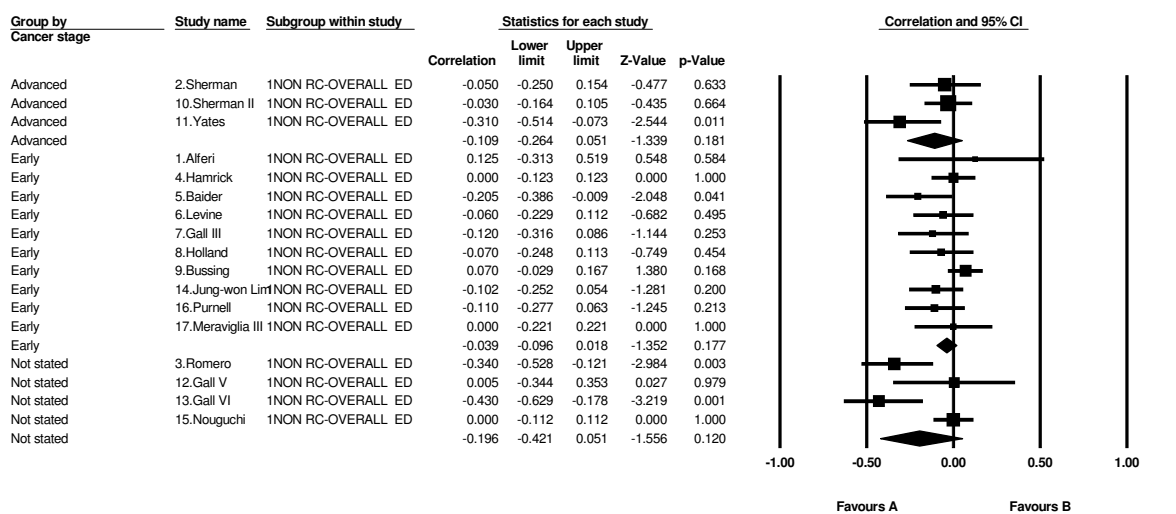
Education for general religiousness – overall emotional distress

Meta Analysis



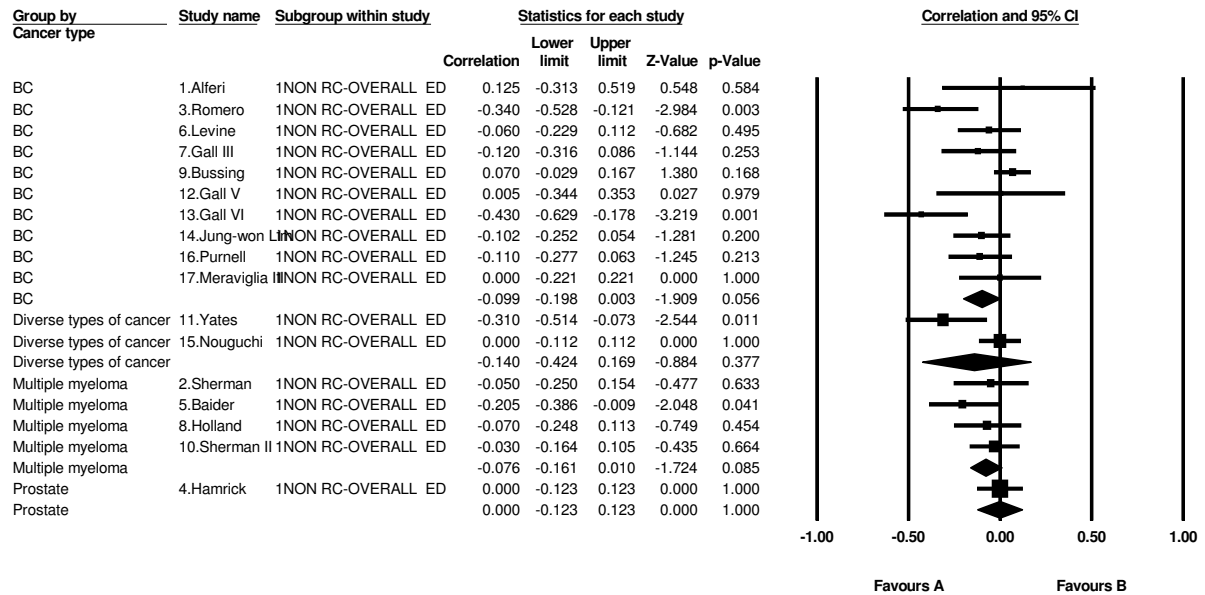
Cancer stage for general religiousness – overall emotional distress

Meta Analysis



Cancer type for general religiousness-overall emotional distress

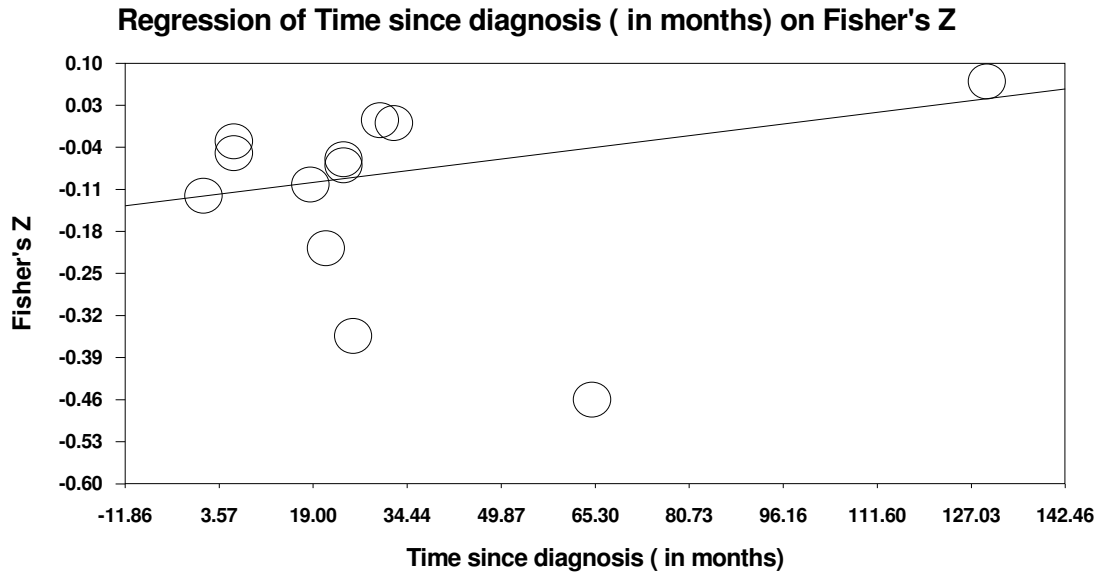
Meta Analysis



Age for general religiousness- overall emotional distress

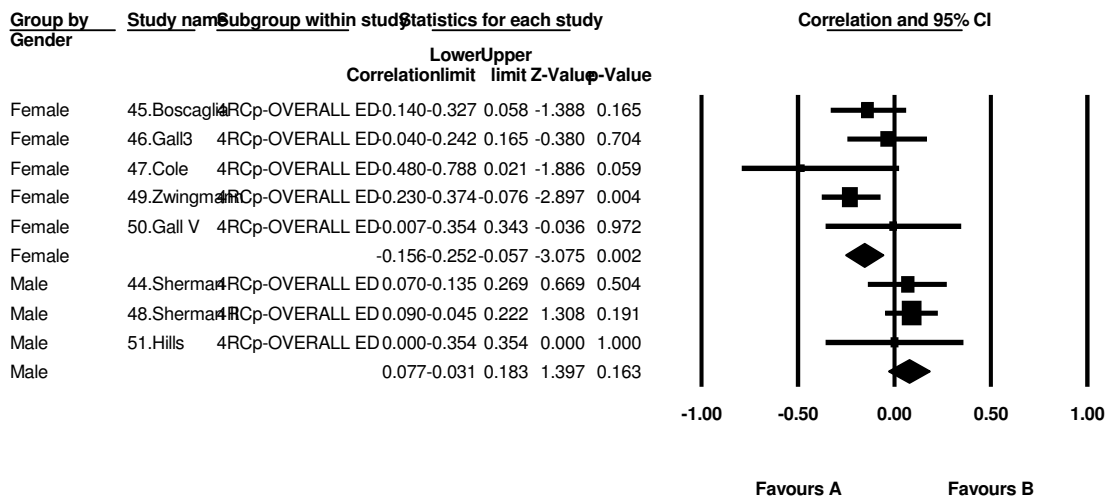


Time since diagnosis for general religiousness – overall emotional distress



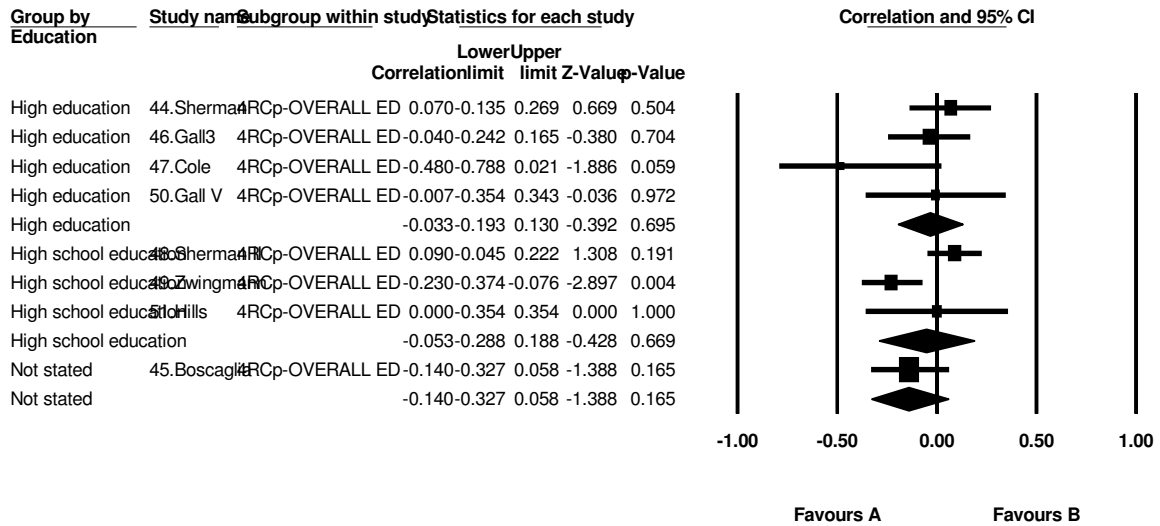
Gender for RCp-ED

Meta Analysis



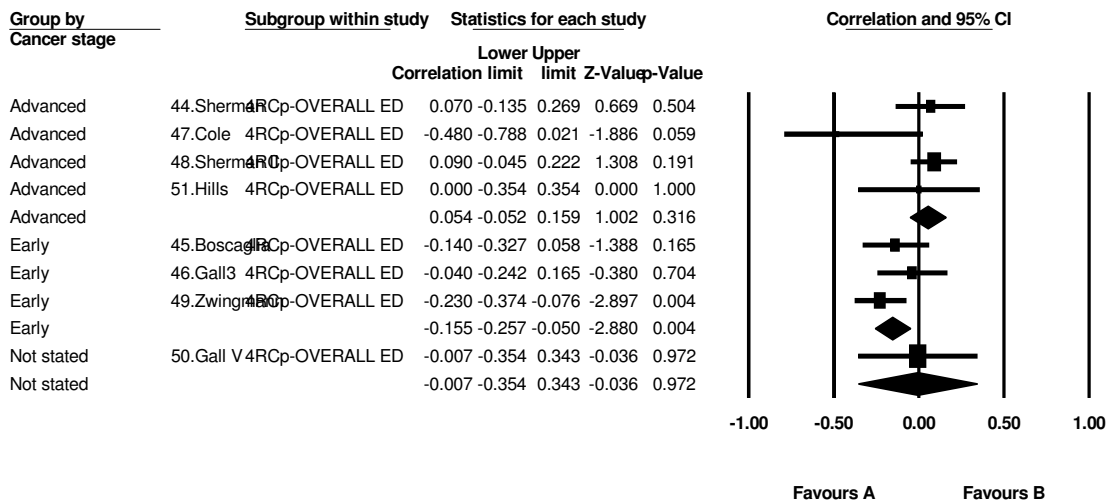
Education for RCp-ED

Meta Analysis



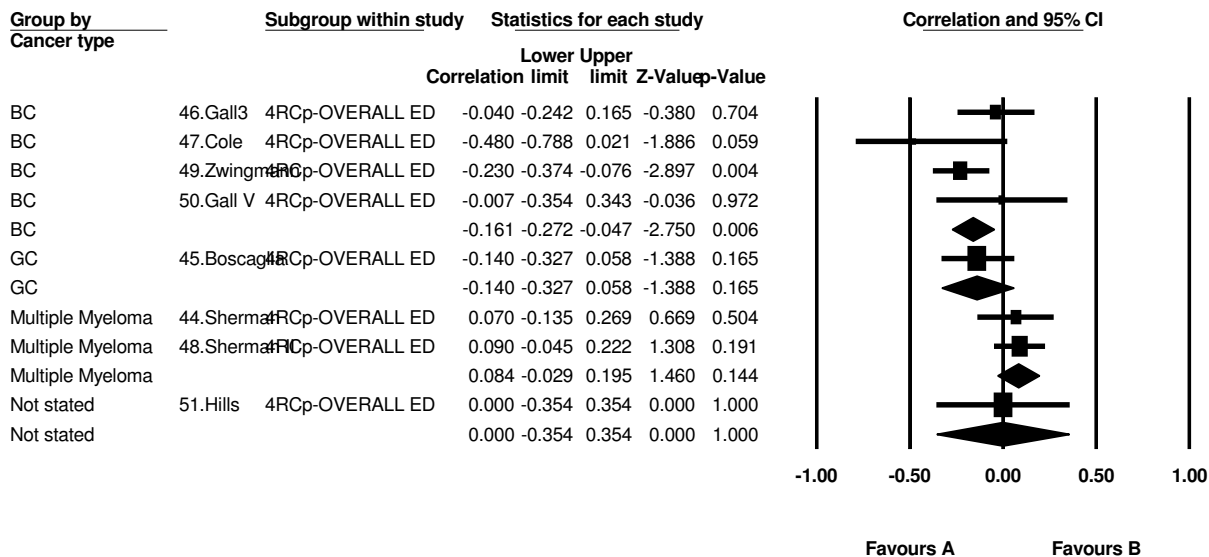
Cancer stage for RCp-ED

Meta Analysis

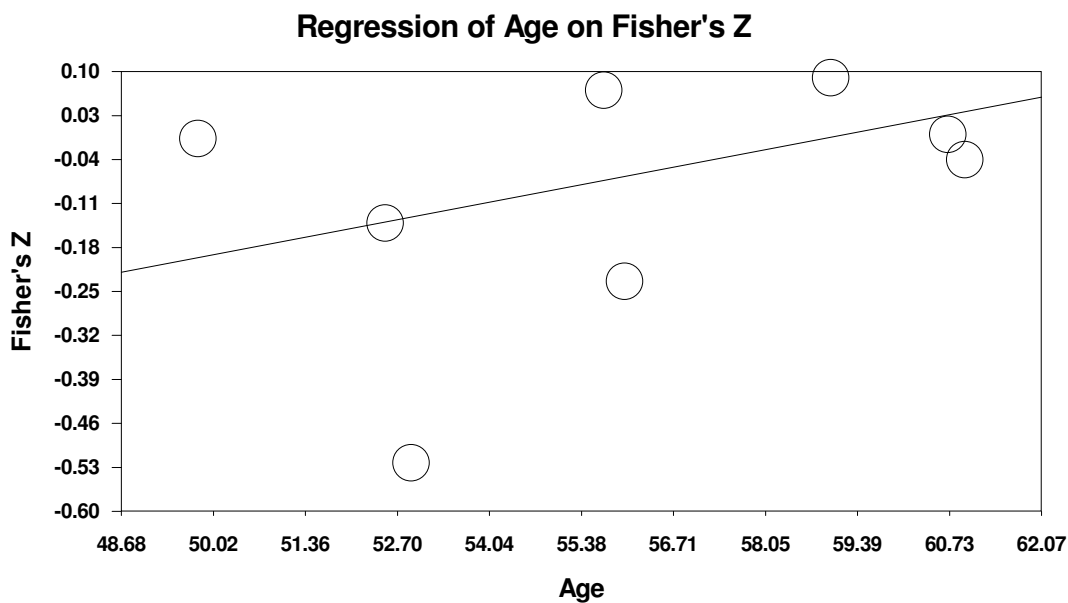


Cancer type for RCp-ED

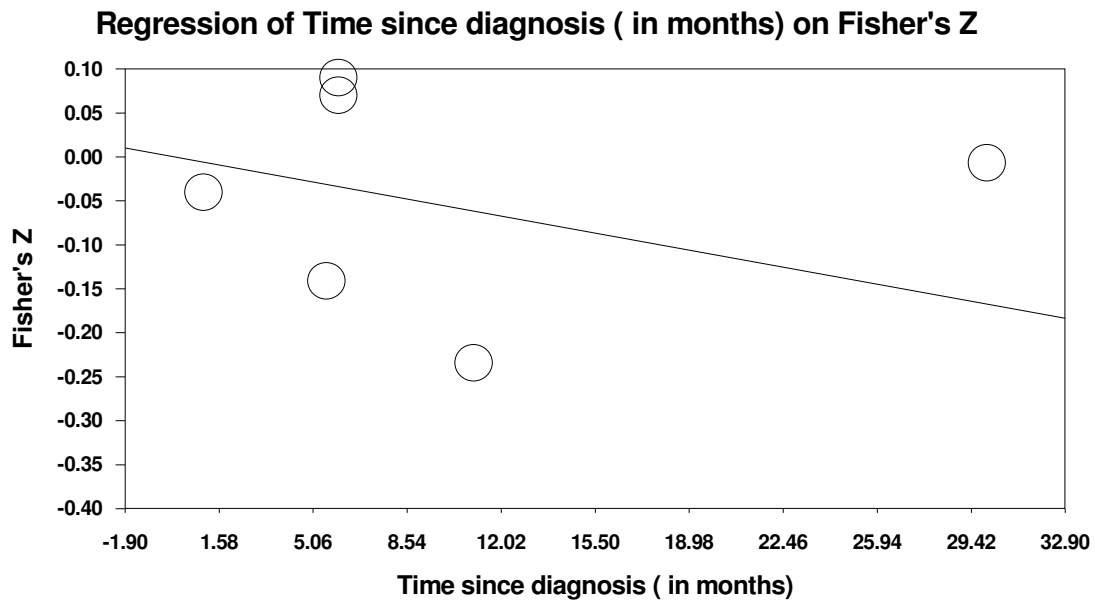
Meta Analysis



Age for RCp-ED

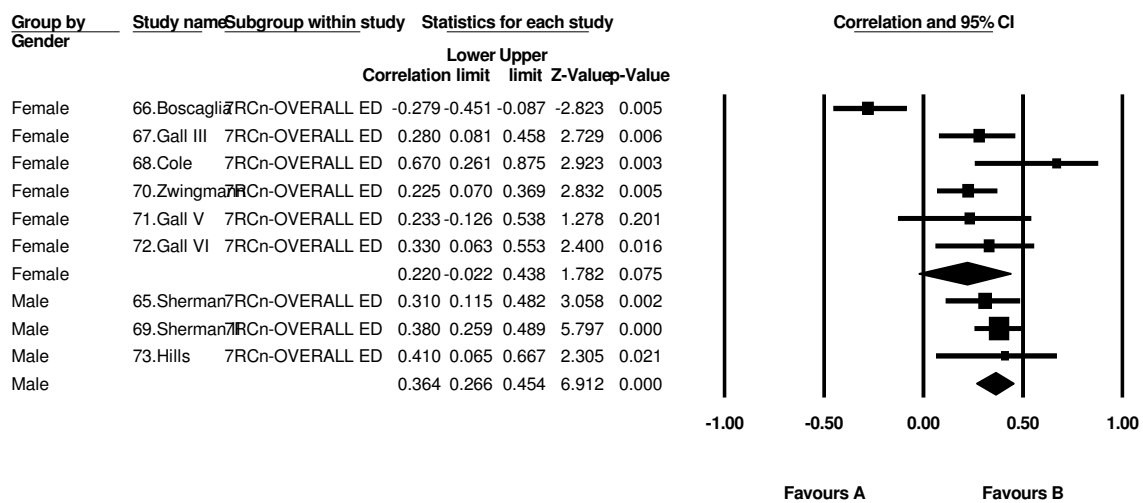


Time since diagnosis for RCp-ED



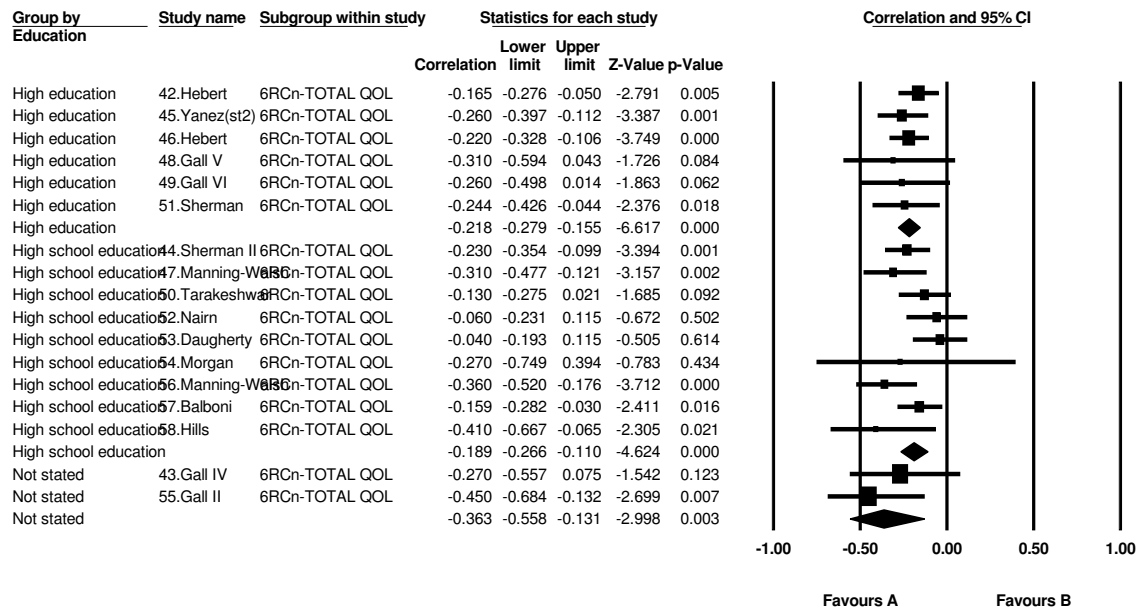
Gender for RCn-ED

Meta Analysis



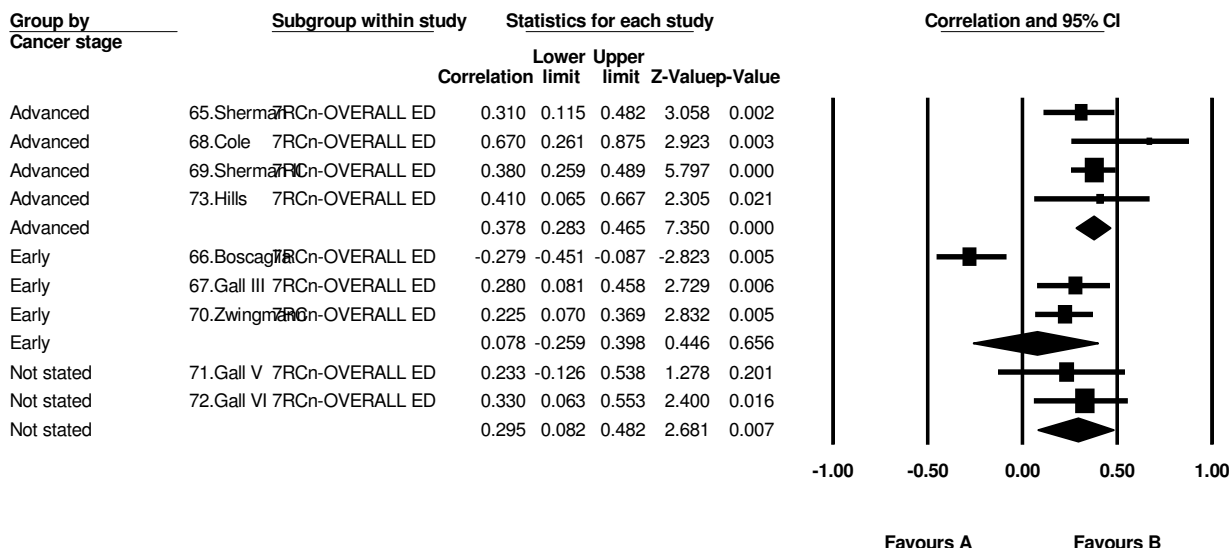
Education for RCn-ED

Meta Analysis



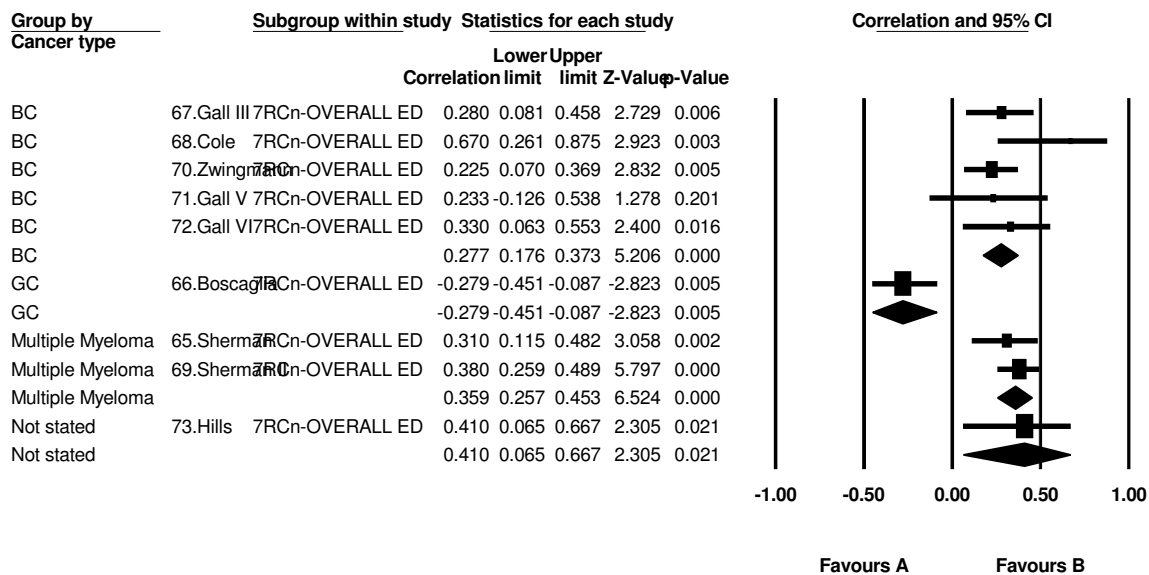
Cancer stage for RCn-ED

Meta Analysis



Cancer type for RCn-ED

Meta Analysis



Age for RCn-ED



Time since diagnosis for RCn-ED