Chapter 6
Religion and Health in Christian Populations

This chapter reviews research on religious involvement and health in non-Muslim populations, where the vast majority are Christians (over 90 %). The review is systematic, i.e., including all published quantitative research from the 1950s through the middle of 2010. These studies have been individually described and summarized in the first and second editions of the *Handbook of Religion and Health* (Koenig et al. 2001, 2012). Only quantitative research, studies that objectively measure and quantify religious involvement and correlate it with similarly quantified health outcomes, are included here. We briefly summarize the results of that research, removing studies that focus on Muslim-majority populations, which will be the focus of chapters that follow this one. After defining the terms "religion," "religious coping," and "spirituality," we organize the research into sections on mental health, social health, health behaviors, and physical health. We then briefly examine the psychological, social, behavioral, and genetic mechanisms that may underlie the relationship between religion and physical health in Christian populations.

Definitions

Before discussing the research, we must define what we mean by religion, religious coping, and the increasingly popular term, spirituality.

Religion is in disfavor today because it tends to divide people and cause conflict because of differing beliefs (as discussed in the last chapter). However, religious beliefs and practices can be easily measured and quantified. Most importantly, they are quite distinct from the health outcomes that religion might influence. We define religion as beliefs, practices, and rituals related to the Transcendent, where in monotheistic traditions, the Transcendent is also called God, Allah, or HaShem. Religion may also involve beliefs about spirits, angels, demons, or other supernatural forces. Religions usually have doctrines about life after death and rules to guide behavior during the present life to prepare for the life to come. Religion is often organized as

H.G. Koenig and S. Al Shohaib, *Health and Well-Being in Islamic Societies: Background, Research, and Applications*, DOI 10.1007/978-3-319-05873-3_6,

a community and maintained as an institution. Religion, however, can also exist outside of an institution and may be practiced alone and involve private expressions of devotion to the Transcendent. At its core, religion involves an established tradition that arises out of a group of people with common beliefs about and rituals concerning the Transcendent.

Religious coping involves the use of religious beliefs or practices to cope with and make sense of difficult life experiences that involve loss or change. For example, in monotheistic traditions, religious coping involves behaviors such as praying to God in order to derive comfort and hope during emotionally trying times, reading religious writings for inspiration and guidance, attending religious services to be uplifted by worshiping God together, and seeking support from members of one's congregation or giving support to others for religious reasons. Religious coping may also involve cognitive processes, including beliefs about a better life after death when pain and suffering will be no more or beliefs in a loving, caring God who is in control, has a purpose for the world and individuals in it, and has the power to transform difficult circumstances so that good outcomes are possible. Thus, both behaviors and beliefs are involved in religious coping.

Spirituality, in its original use, was a term describing a subset of deeply religious people who had submitted their lives to God or the Transcendent. Examples of "spiritual" people often included the clergy or the prophets described in the Holy Scriptures. These were persons whose lives centered on their faith. Spiritual individuals were distinguished from the vast majority of other religious people for whom religion was important, but not fully integrated into their lives. The definition of spirituality, however, has changed over the past 25 years. The modern definition of spirituality has become a vague, nebulous concept that people often define for themselves, becoming so broad that it has lost all distinction. The term spirituality has even expanded to include those who are not religious at all and those who have rejected traditional religion (*secular* spirituality). Furthermore, there is now considerable overlap between definitions of spirituality and positive aspects of mental health, such as peacefulness, being connected with others, having meaning and purpose, and experiencing existential well-being, which are used to characterize the spiritual person. Because of its nebulous and vague nature, its definition as a positive state of mental health, and the difficulty involved in measuring it as a distinct and unique construct, the modern definition of spirituality is not useful in research studies whose aim is to determine relationships with mental or physical health. Attempts to do so have resulted in findings that are impossible to interpret given the tautology in the constructs being correlated. Note, however, that the situation is quite different in clinical settings, where the goal is to find common ground with patients, both religious and nonreligious, so that conversation may take place (see Chap. 14). In those circumstances, the term spirituality can be quite useful. Spirituality as defined today, however, is not useful when conducting research.

For the reasons described above, we prefer the traditional definition of spirituality (i.e., referring to a subset of deeply religious persons) when conducting research. Therefore, as we discuss and summarize the research, we will use the term religion

(or use the terms religion or religious, and spiritual or spirituality, interchangeably, i.e., R/S). We will now summarize the research on R/S and mental, social, behavioral, and physical health in Christian-majority populations.

Mental Health

R/S beliefs and practices are used by many Christians to cope with psychological stressors, important losses, traumatic events, and changes in physical health. A study of medically ill patients in North Carolina in 1998 found that 90 % said they used religion to cope with health problems (Koenig 1998). Similarly, a national random survey of the U.S. population during the week following the September 11, 2001, terrorist attacks on the World Trade Centers, found that 90 % of Americans turned to religion to cope with the anxiety and stress of that time (Schuster et al. 2001). Literally hundreds of studies (454 in the two editions of the *Handbook*) have examined the role that R/S plays in coping with stress or illness. The vast majority indicate that people turn to religion during these times and often find it beneficial (Koenig 2012). Of the studies on religious coping, more than 93 % ($n=423$) were conducted in Christian-majority samples, 2.4 % ($n=11$) in Muslim-majority samples, 2.0 % ($n=9$) in Chinese or Southeast Buddhist populations, 2.0 % ($n=8$) in Jewish samples (Israel), and 0.6 % ($n=3$) in Hindu populations (India). The ability of religion to provide meaning and purpose to negative life circumstances, guidance on how to deal with negative events, and a community of people for psychosocial, social, and practical support are major pathways by which R/S helps to neutralize negative emotions and increase positive ones.

Negative Mental Health

We now review research that has examined relationships between level of R/S involvement, negative emotions, and mental disorders. Examined in the present section are studies focused on relationships between R/S and depression, suicide, anxiety, psychosis, and alcohol/drug use or abuse in Christian-majority populations.

Depression. Of 444 quantitative studies, 414 (93 %) were in Christian-majority populations. The remaining studies were in Muslim ($n=13$), Buddhist ($n=9$), Jewish ($n=5$), or Hindu ($n=2$) majority samples. Of the 414 studies in Christians, 254 (61 %) reported significant inverse relationships between R/S and depression, including 6 studies at a statistical trend level ($0.05>p<0.10$), whereas 26 studies (6 %) reported a significant positive relationship between R/S and greater depression, including 2 studies at a trend level. There were 28 clinical trials, of which 17 (61 %) reported that R/S interventions for depression were significantly more effective than standard treatments or a control condition, and 2 studies (7 %) found that R/S interventions were less effective.

Suicide. Of 141 studies that examined relationships between R/S and suicidal thoughts, attempts, or completed suicide, 126 (90 %) were in Christian-majority populations, whereas the other reports came from Muslim-majority countries ($n=5$), Israel ($n=4$), China ($n=4$), India ($n=1$), and the USA and Kuwait ($n=1$). Of the studies in Christian populations, 99 (79 %) found inverse relationships between religiosity and attitudes toward suicide, suicidal thoughts, or suicidal behaviors (4 at a trend level). Two found positive relationships (2 %). There were also 30 studies that examined attitudes toward physician-assisted suicide and R/S, and all 30 (100 %) found significant inverse relationships.

Anxiety. Of 299 studies that explored relationships between R/S and anxiety level, 245 (82 %) were conducted in Christian-majority countries. The other 54 studies came from Muslim-majority countries ($n=23$), Buddhist-majority countries ($n=13$), Israel ($n=13$), and India ($n=5$). Of studies in Christian populations, 120 (49 %) reported significant inverse relationships between R/S and anxiety (4 at a trend level), whereas 24 (10 %) found significant positive relationships between R/S and anxiety.

Psychosis. Of 43 studies that examined relationships with R/S, 39 (88 %) were in Christian-majority countries, whereas 1 each came from India, Israel, China, and Egypt (Muslim). Of studies among Christians, 11 (28 %) found significant inverse relationships with R/S (1 at a trend level) and 9 (23 %) reported more psychotic symptoms among those who were more R/S (1 at a trend level). The remaining studies reported no association (29 %) or mixed findings (21 %) depending on the R/S characteristic measured.

Alcohol Use/Abuse. At least 278 studies have examined R/S and alcohol use/abuse, of which 269 (97 %) were conducted in Christian-majority countries. The remaining studies were in Buddhists (Singapore, Thailand, South Korea), Jews (4 studies from Israel), and Muslims (one each in Turkey and Lebanon). Of studies in Christians, 233 (87 %) reported significant inverse relationships (11 at a trend level) with R/S and 4 (1 %) reported positive relationships (1 at a trend level).

Drug Use/Abuse. Of 185 studies that focused on R/S and illicit drug use/abuse, 182 (98 %) were in Christian-majority populations. The other three studies were among Jews in Southeast Asia, Jews in Israel, and Muslims in Bosnia. Of those 182 studies in Christians, 154 (85 %) found significant inverse relationships (3 at a trend level) and 2 studies (1 %) found positive relationships.

Positive Mental Health

Religious involvement not only helps to neutralize negative emotions but may also be associated with positive emotions such as overall happiness, life satisfaction, well-being, hope, optimism, meaning and purpose, self-esteem, sense of control, and a wide range of positive character traits (forgiveness, altruism, etc.).

Well-Being. Of 326 studies that examined R/S and well-being, happiness, or life satisfaction, 301 (92 %) were conducted in Christian-majority countries. The remaining studies were from Muslim-majority countries ($n=8$), Israel ($n=8$), Singapore ($n=3$), India ($n=3$), and from China, South Korea, and East Asia (one study each). Of studies in Christians, 237 (79 %) reported significant positive relationships between R/S and greater well-being (8 at a trend level), whereas 3 (<1 %) reported inverse relationships.

Hope. At least 40 studies have examined R/S and hope, with 39 in Christian-majority populations and 1 among Muslims in Kosovo and Bosnia. Of studies in Christians, 29 (74 %) found significant positive relationships (2 at a trend level) and none reported inverse relationships.

Optimism. Of 32 studies, 30 (94 %) were in Christian populations, whereas the remaining 2 studies were in Muslim (Kuwait) and Buddhist (Singapore) countries. Of those in Christians, 25 (83 %) reported significant positive relationships. No studies found lower optimism among those who were more R/S.

Meaning and Purpose. Of 45 studies that examined R/S and meaning or purpose in life, 44 (98 %) were in Christian-majority populations and 1 was conducted in Israel. Of those in Christians, 41 (93 %) reported significant positive relationships.

Self-Esteem. There have been at least 69 studies on R/S and self-esteem, of which 65 (94 %) were in Christian-majority countries, 3 were in Muslim-majority countries (Iran, Pakistan, Iraq), and 1 was conducted in Singapore (Buddhist). Of studies in Christians, 40 (62 %) found significantly great self-esteem in those who were more R/S and 2 (3 %) found significantly lower self-esteem.

Sense of Control. Sense of control is often categorized as either having an *internal* locus (where persons believe they control their own destiny through personal decisions) or an *external* locus (where persons believe they are helpless to direct their lives and that powerful other people or institutions control the future). Usually, the notion of God being in control is not included in having an external locus of control (although some might interpret it that way). Instead, God locus of control should be assessed using a different measure (e.g., God Health Locus of Control Scale), which measures to what extent a person believes that God is in control of health outcomes or that God empowers the person to take control of their health. For our purpose here, we focus on the relationship between R/S and the more traditional measures of personal control (internal or external locus of control). Internal locus of control has long been associated with better mental health and external locus of control with worse.

At least 22 studies had examined R/S and locus of control, of which 20 (91 %) were in Christian-majority populations, 1 in Iran, and 1 in Israel (examining Arabs and Jews). Of studies in Christians, 12 (60 %) reported a greater sense of personal or internal control among those who were more R/S, whereas 3 studies (15 %) found significantly lower internal or personal control.

Personality Traits

Personality traits are long lasting, enduring ways that people relate to others (often with a strong genetic basis). The most widely used model for understanding personality traits is the "Five-Factor Model." This model examines five aspects of personality called "the Big Five" (extraversion, neuroticism, conscientiousness, agreeableness, openness to experience). These are usually measured using the NEO Personality Inventory. We now summarize research on R/S and these five personality traits in Christians.

Extraversion. Extraverted people tend to be more outgoing, talkative, and energetic in social situations, which contrasts with introverted people who tend to be more reserved, less outgoing, more reflective, inner focused, and tend to avoid social situations. Our systematic review identified 50 studies that examined relationships with R/S, of which 46 (92 %) were in Christian-majority populations, 2 in Muslim countries, and 2 in Israel. Of studies in Christians, 18 (39 %) found that R/S was related to greater extraversion, 3 (7 %) with less extraversion, and the remaining studies reported that there was no association.

Neuroticism. Neurotic people are characterized by a long-standing pattern of anxiety, moodiness, worry, feeling uptight, and jealous. They tend to be self-conscious, shy, and react poorly to stress. Of 54 studies that have examined R/S and neuroticism, 51 (94 %) were from Christian-majority populations, 2 from Israel, and 1 from Malaysia. Of studies in Christians, most studies (61 %) found no relationship with R/S, whereas a small proportion (24 %, $n=12$) reported inverse relationships (less neurotic) and even a smaller percentage (10 %, $n=5$) found a positive relationship (more neurotic).

Conscientiousness. Conscientious individuals tend to be efficient, thorough, well organized, systematic, neat, careful, and self-disciplined, in contrast to those who are more laid back, less goal oriented, and more likely to engage in antisocial or criminal behavior. Of 30 studies, 28 (93 %) were in Christian-majority populations, and 1 each was from Israel and Malaysia. Of studies in Christians, 19 (68 %) reported significant positive relationships with R/S and 1 study (4 %) found a significant negative relationship (using the controversial Quest scale as a measure of R/S and the negative relationship was found only in men).

Agreeableness. Those characterized by this trait tend to be cooperative, kind, sympathetic, warm, and considerate toward others. These people are more likely to be considered trustworthy, honest, and good by other people. We identified 30 studies that examined the relationship with R/S, of which 28 (93 %) were in Christian-majority populations, and 1 each in Israel and Malaysia. Of studies in Christians, 24 (86 %) reported significant positive relationships with R/S and no studies found negative relationships.

Openness to Experience. Those who score high on this trait tend to have active imaginations, prefer variety, and are more intellectually curious. They tend to reject

conventional or traditional beliefs or ideas and prefer new experiences to familiar routines. There have been 26 studies examining relationships with R/S, of which 24 were in Christian-majority populations and 1 each in Israel and Malaysia. Of studies in Christians, 10 (42 %) reported significant positive relationships with R/S and 2 (8 %) found negative relationships (both measuring traditional or conservative religious beliefs).

Social Health

Social health involves a number of domains, including social support (number and quality of social connections), marital stability, delinquency or crime (antisocial behaviors), and social capital. Each of these social factors has been associated with mental and physical health in a wide range of studies.

Social Support. Social support includes emotional support and tangible support (physical help) received from others. Components of social support include size of social network, number of contacts per week (by telephone, in person, and, nowadays, via social media), and a person's subjective sense that people are available and willing to provide support when needed. Of 74 studies identified in our systematic review, 70 (95 %) were in Christian-majority populations, 2 were in Muslim countries, and 1 each in Taiwan and Israel. Of studies in Christians, 58 (83 %) reported significant positive relationships with R/S and no studies found negative relationships.

Marital Stability. Marital stability involves maintaining marital ties (vs. divorce), satisfaction with marriage, and absence of spousal abuse. Of 79 studies that have examined the relationship with R/S, 75 (95 %) were in Christian-majority populations, 2 in Israel, and 2 in Muslim countries. Of the studies in Christians, 64 (85 %) reported significant positive relationships with R/S (1 at a trend level) and no studies found negative relationships.

Delinquency and Crime. At least 104 studies have examined relationships between R/S and either youth crime (delinquent acts) or adult criminal behavior, of which 99 (95 %) were in Christian-majority populations, 3 were in Muslim countries, and 1 each in Israel and Taiwan. Of the studies in Christians, 79 (80 %) found significantly less delinquency/crime in those who were more R/S (5 at a trend level), whereas 2 studies (2 %) reported greater delinquency/crime.

Social Capital. Social capital is a measure of community health and is often measured by level of community participation, volunteerism, trust, and membership rates in civic, political, or social justice organizations. Our systematic review uncovered 14 studies that examined relationships with R/S, of which 12 (86 %) were in Christian-majority populations, 1 was in Korea, and 1 was in Turkey. Of the studies in Christians, 10 (83 %) found significant positive relationships with R/S and none found negative relationships.

Health Behaviors

Health behaviors are key to living a healthy disease-free life and avoiding chronic illness. Activities that influence physical health include cigarette smoking, exercise, diet, weight, and sexual behavior.

Cigarette Smoking. At least 137 studies have examined R/S and smoking, of which 125 (91 %) were in Christian-majority populations, 6 in Israel, 5 in Muslim-majority countries, and 1 in Thailand (a country that is 69 % Buddhist). Of the studies in Christians, 114 (91 %) found significant inverse relationships between R/S and cigarette smoking (3 at a trend level) and no studies found higher rates of smoking in those who were more R/S.

Exercise. Of 37 studies that examined relationships with R/S, 34 (92 %) were in Christian-majority populations and 3 were conducted in Israel (including 1 among Muslims). Of those in Christians, 25 (74 %) reported greater exercise or physical activity in those who are more R/S (2 at a trend level), and 4 (12 %) reported significantly less exercise/activity among the more religious.

Diet. At least 22 studies have examined relationships with diet or nutritional status, and all (100 %) were in Christian-majority populations. Of those, 12 (55 %) found better diet among those who were more R/S (1 at a trend level) and 1 found worse diet.

Weight. Of all health characteristics, maintaining an ideal body weight is the one health behavior that religious people have trouble with. In general, those who are more religious weigh more than those who are less religious. Of 36 studies that examined the relationship, 33 (92 %) were in Christian-majority populations and 3 were from Israel (1 that focused on Muslims). Of studies in Christians, 5 (15 %) found lower weight (or less underweight) among the more R/S, whereas 13 (39 %) reported heavier weight or higher body mass index. Christian communities encourage eating together as part of fellowship, and the food that is served is not always low in calories.

Sexual Behavior. We identified 95 studies that examined R/S and risky sexual behavior, of which 93 (98 %) were in Christian-majority populations, 1 was from Israel, and 1 was from Iran. Of the studies in Christians, 80 (86 %) reported inverse relationships between R/S and risky sexual activity (1 at a trend level), and 1 study found more such activity among imprisoned sex offenders in Australia who were more religious.

Physical Health

Areas of physical health in which researchers have examined R/S include coronary heart disease, hypertension, cerebrovascular disease, dementia, immune function, endocrine function, metabolic disorders, cancer, self-rated health, and mortality.

Heart Disease. Our systematic review examining R/S and coronary artery disease (CAD) uncovered 20 studies published through the middle of 2010, of which 13 (68 %) were in Christian-majority populations, 3 were from Israel, 2 from India, and 1 from Muslim countries (Albania and Saudi Arabia). Of studies in Christians, 7 (54 %) found significantly lower rates of CAD in those who were more R/S, whereas 1 study found a higher rate of CAD in the more R/S.

In addition, 16 studies have explored links between R/S and cardiovascular functions (cardiovascular reactivity, heart rate variability), surgical outcomes, or levels of inflammatory markers or coagulation factors that predict higher CAD risk (C-reactive protein, fibrinogen). Most of these studies (75 %) were in Christian-majority populations, 3 were from Turkey, and 1 from India. Of the 12 studies in Christians, 8 (67 %) reported significantly better cardiovascular functioning in the more R/S (3 at a trend level) and 1 study reported worse cardiovascular functions in college students who were more R/S.

Hypertension. At least 63 studies have examined relationships with R/S, of which 53 (84 %) were conducted in Christian-majority populations, 5 in Muslim-majority populations, 3 in Buddhist countries, and 1 each in Jewish (Israel) and Hindu (India) populations. Of studies in Christians, 31 (58 %) reported lower blood pressure (BP) or less hypertension in those who were more R/S (5 at a trend level), whereas 7 studies (13 %) found higher BP among the more R/S (1 at a trend level).

Cerebrovascular Disease. Only a few studies have examined the relationship between R/S and stroke or cerebrovascular disease. Our systematic review identified 9 such studies, of which 7 (78 %) were in Christian-majority populations and 2 in Muslim countries. Of studies in Christians, 4 (57 %) reported inverse relationships with R/S (1 at a trend level), whereas 1 study reported greater carotid artery thickening (known to predict an increased risk of stroke) in those who were more R/S.

Dementia/Alzheimer's Disease. There have also been 21 studies that examined relationships between R/S and presence of dementia, Alzheimer's disease, or the decline in memory associated with increased age. Of those, 17 (81 %) were in Christians and the remaining 2 studies were from Taiwan and Israel. Of studies in Christians, 10 studies (59 %) reported significant positive relationships between R/S and memory, including several prospective studies, whereas 2 studies (20 %) found more rapid memory decline or greater dementia in the more R/S.

Diabetes. The findings are less consistent for metabolic disorders such as diabetes, hypercholesterolemia, and overall allostatic load (not surprising given that those who are more R/S tend to be overweight). Concerning diabetes, we identified 17 studies, of which 11 were in Christian-majority populations, 4 were in Muslim countries, and 1 each in Israel and India. Among Christians, 2 studies (18 %) reported significantly better diabetic control in those who were more R/S, 3 (27 %) reported worse diabetic control, and the remainder found no association.

Cholesterol. With regard to cholesterol levels or allostatic load, our systematic review identified 24 studies, of which 16 (67 %) were in Christian-majority

populations, 7 in Muslim-majority countries, and 1 in India. Of the 16 studies in Christian populations, 7 (44 %) reported lower cholesterol or lower allostatic load in those who were more religious and 2 studies (13 %) reported significantly higher cholesterol levels.

Immune Function. We identified 30 studies that examined relationships between R/S, immune function, and pro- or anti-inflammatory cytokine levels (indicators of immune system functioning). Of those, 24 (83 %) were in Christian-majority populations, 2 were in Buddhist countries, 3 in Muslim countries, and 1 in southern India. Of studies in Christians, 16 (67 %) found positive relationships with better immune function or lower levels of pro-inflammatory markers (1 at a trend level). Although no studies in Christians found only worse immune function, one study in breast cancer patients reported mixed findings, three reported positive findings (increased CD4/CD3, natural killer cells, and total lymphocytes), and one found worse immune function (lower cutaneous immune response to antigens).

In addition, two studies examined the effects of R/S interventions on interferon gamma, both finding a significant increase as a result of the intervention. Interferon gamma (produced by natural killer cells) is important to the immune system because it can inhibit viral replication directly and has immunostimulatory and immunomodulatory effects. A third study reported that a R/S intervention decreased levels of anti-inflammatory cytokines IL-4 and IL-10 (which were increased above normal at baseline in patients with recently diagnosed breast cancer, thus indicating a positive effect for the intervention).

Susceptibility to infection and virus concentration in blood (viral load) have also been examined as a proxy for immune function in 12 studies, of which 11 were in Christian-majority populations and 1 was in southern India. Of studies in Christian populations, 7 (64 %) reported significantly less susceptibility to infection or reduced viral load in those who were more R/S (no studies found greater susceptibility or increased viral load).

Endocrine Function. We identified 31 studies that examined relationships with R/S or effects of R/S interventions on endocrine function. These studies focused on the stress hormones cortisol, epinephrine, and norepinephrine. Again, most of these studies (27 or 87 %) were in Christian-majority populations and 4 were in Buddhist-majority countries (China or Thailand). Of studies in Christians, 20 (74 %) found positive relationships with better endocrine function or reported that a R/S intervention (often meditation) improved endocrine function. No studies reported a relationship with worse endocrine function or greater stress hormone levels.

Cancer. Our systematic review identified 29 studies that examined connections between R/S and either susceptibility to cancer or prognosis of cancer after it had developed. Of those studies, 28 (97 %) were in Christians and 1 study was in Buddhists/Taoists (China). About half the studies in Christians (54 %) found lower risk of cancer or a better prognosis (one at a trend level). Two studies (7 %), however, reported that women raised in Protestant homes had higher risk of breast

cancer than those with no religious affiliation, and that women involved in religious occupations had a higher death rate from cancer.

Self-Rated Health. Self-rated health is a person's sense of their overall physical health condition and is usually rated from poor to excellent. Such ratings are strongly correlated with actual health and mortality (Idler and Benyamini 1997). Our systematic review uncovered 50 studies that examined relationships with R/S, of which 48 (96 %) were in Christian-majority populations and 1 each was from Taiwan and Israel. Of studies in Christians, 29 (60 %) reported significantly better self-rated health in those who were more R/S, whereas 5 (17 %) reported worse self-rated health.

Mortality. We identified 121 studies that examined prospective relationships between R/S and overall mortality, of which 106 (88 %) were in Christian-majority populations, 9 were from Israel, 5 from Taiwan/China, and 1 from Japan. Of studies in Christians, 72 (68 %) found significantly greater longevity or reduced mortality in those who were more R/S (3 at a trend level), whereas 7 (6 %) reported greater mortality.

Mechanisms and Pathways

Based on the research above, and reports from qualitative studies that have asked Christians to describe the role that religion plays in their health, we present here a theoretical model of how R/S involvement in the Christian tradition might influence physical health and extend longevity. The source of the health benefits of Christian faith in this model is a close personal attachment to God, which has been shown to influence the relationship between religious involvement (such as prayer) and mental health outcomes (Bradshaw et al. 2008). This model is based on the role that religious faith plays in coping with negative life events involving loss, change, or trauma. It hypothesizes that Christian beliefs provide meaning and purpose to traumatic life events, foster positive human traits (such as forgiveness, altruism, gratefulness, etc.), and provide guidance on how to make decisions that enhance individual and community health and well-being. Such influences increase the experience of positive emotions (peace, well-being, happiness) and decrease negative emotions (depression, anxiety, addiction). Christian beliefs and practices may also boost social support, increase social interactions, and encourage the providing of support to others, all of which help to buffer stressful events and negative life circumstances. Finally, religious involvement is thought to reduce negative health behaviors such as alcohol intake, cigarette smoking, a sedentary lifestyle, unhealthy diet, and risky sexual behaviors, thereby improving health. These are the primary pathways by which R/S within the Christian tradition might impact physical health (Fig. 6.1).

Note, however, that the effects of R/S are likely impacted by genetic factors, developmental experiences (both in childhood and adult life), and by personality

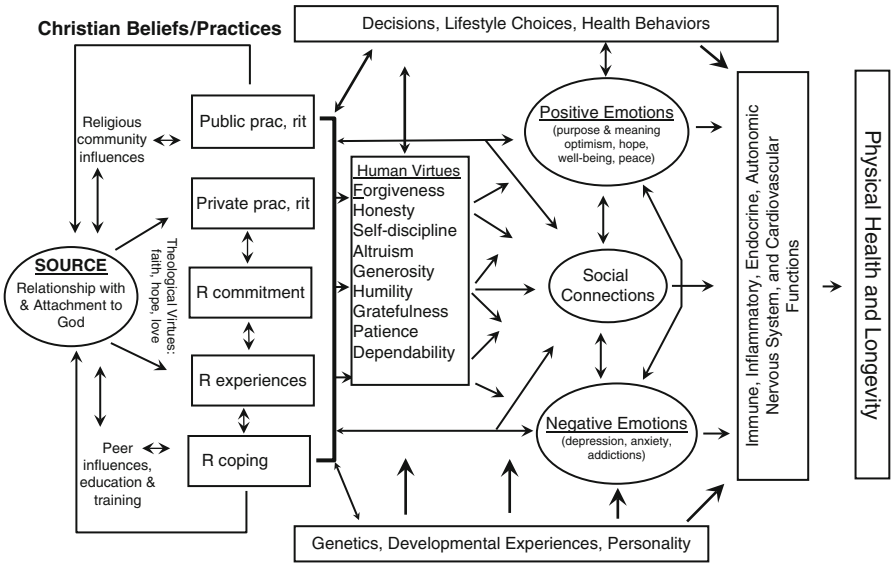

Fig. 6.1 Theoretical pathways by which Christianity is hypothesized to influence mental and physical health. This figure has been adapted from Figure 28.1, p 587, *Handbook of Religion and Health,* 2nd ed. New York, NY: Oxford University Press, 2012. Used with permission

factors (rooted in genetic predispositions and early environmental influences). Thus, the relationship is a complex one that is related to beliefs, behaviors, and decisions made by the individual and by a combination of genetic and environmental factors that are operating independent of the individual.

Summary and Conclusions

Most studies that have examined relationships between R/S and mental, social, behavioral, and physical health have been conducted in populations where the majority of participants are Christian (see Table 6.1 for summary). A majority of these studies report that those who are more religious or spiritual experience fewer negative mental health problems (less depression, suicide, anxiety, alcohol and drug use), more positive emotions (greater well-being, hope, optimism, sense of meaning and purpose, self-esteem, and internal sense of control), and more positive personality traits (greater conscientiousness and agreeableness). Most studies also find that Christian beliefs and behaviors are related to greater social support and marital stability, less delinquency/crime, and overall greater social capital. Negative health behaviors such as cigarette smoking, a sedentary lifestyle, poor diet, and risky sexual behaviors are less frequent among those who are more R/S (although religiosity in Christians is related to being overweight). Physical health also appears better

Table 6.1 Summary of studies and findings in Christian-majority countries through mid-2010 based on systematic review[a]

	Studies in Christians		Findings in Christians	
All studies	Total no.	No. (% of total)	Positive[b] no. (%)	Negative no. (%)
Negative mental health				
Depression	444	414 (93)	254 (61)	26 (6)
Suicide	141	126 (90)	99 (79)	2 (2)
Anxiety	299	245 (82)	120 (49)	24 (10)
Psychosis	43	39 (88)	11 (28)	9 (23)
Alcohol use/abuse	278	269 (97)	233 (87)	4 (1)
Drug use/abuse	185	182 (98)	154 (85)	2 (1)
Negative mental health				
Well-being	326	301 (92)	237 (79)	3 (1)
Hope	40	39 (98)	29 (74)	0 (0)
Optimism	32	30 (94)	25 (83)	0 (0)
Meaning/purpose	45	44 (98)	41 (93)	0 (0)
Self-esteem	69	65 (94)	40 (62)	2 (3)
Sense of control	22	20 (91)	12 (60)	3 (15)
Personality traits				
Extraversion	50	46 (92)	18 (39)	3 (7)
Neuroticism	54	51 (94)	12 (24)	5 (10)
Conscientiousness	30	28 (93)	19 (68)	1 (4)
Agreeableness	30	28 (93)	24 (86)	0 (0)
Openness	26	24 (92)	10 (42)	2 (8)
Social health				
Social support	74	70 (95)	58 (83)	0 (0)
Marital stability	79	75 (95)	64 (85)	0 (0)
Delinquency/crime	104	99 (95)	79 (80)	2 (2)
Social capital	14	12 (86)	10 (83)	0 (0)
Health behaviors				
Cigarette smoking	137	125 (91)	114 (91)	0 (0)
Exercise	37	34 (92)	25 (74)	4 (12)
Diet	22	22 (100)	12 (55)	1 (5)
Weight	36	33 (92)	5 (15)	13 (39)
Sexual behavior	95	93 (98)	80 (86)	1 (1)
Physical health				
Heart disease[c]	35	25 (71)	15 (60)	2 (8)
Hypertension	63	53 (84)	31 (58)	7 (13)
Cerebrovascular disease	9	7 (78)	4 (57)	1 (14)
Dementia/Alzheimer's disease	21	17 (81)	10 (59)	2 (20)
Diabetes	15	11 (73)	2 (18)	3 (27)
Cholesterol/allostatic load	24	16 (67)	7 (44)	2 (13)
Immune function[d]	44	38 (86)	26 (68)	0 (0)
Endocrine function	31	27 (87)	20 (74)	0 (0)
Cancer	29	28 (97)	15 (54)	2 (7)
Self-rated health	50	48 (96)	29 (60)	5 (17)
Mortality	121	106 (88)	72 (68)	7 (6)

[a]*Handbook of Religion and Health*, 1st and 2nd editions (Oxford University Press 2001 and 2012)
[b]"Positive" means *better* health and "negative" means *worse* health
[c]Includes coronary artery disease, cardiovascular functions (i.e., cardiovascular reactivity), surgical outcomes, etc.
[d]Includes 12 studies examining susceptibility to infection or virus concentration in blood, an indirect measure of immune function

among those who are more R/S, including less CAD, better cardiovascular functions, lower blood pressure, less cerebrovascular disease, less dementia and slower decline in memory with age, better immune functions, better endocrine functions (lower stress hormone levels), lower rates of cancer, better self-rated health, and greater overall longevity. There are plausible reasons why R/S involvement in Christians might be related to better health, operating through psychological, social, and behavioral pathways known to influence physiological functions responsible for physical health and vigor. In the following chapters, we examine whether relationships between R/S and health in Muslim populations are similar to or different than those found in Christians, and then try to understand why.

References

Bradshaw, M., Ellison, C. G., & Flannelly, K. J. (2008). Prayer, God imagery, and symptoms of psychopathology. *Journal for the Scientific Study of Religion, 47*, 644–659.

Guessoum, N. (2010). Science, religion, and the quest for knowledge and truth: An Islamic perspective. *Cultural Studies of Science Education, 5*, 55–69.

Idler, E. L., & Benyamini, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior, 38*(1), 21–37.

Koenig, H. G. (1998). Religious beliefs and practices of hospitalized medically ill older adults. *International Journal of Geriatric Psychiatry, 13*, 213–224.

Koenig, H. G. (2012). Religion, spirituality and health: The research and clinical implications. *ISRN Psychiatry, 2012*, 1–33. Article ID 278730.

Koenig, H. G., McCullough, M. E., & Larson, D. B. (2001). *Handbook of religion and health*. New York: Oxford University Press.

Koenig, H. G., King, D. E., & Carson, V. B. (2012). *Handbook of religion and health* (2nd ed.). New York: Oxford University Press.

Newton I (1687). Principia, Book III; cited in. In H. S. Thayer (Ed.), Newton's philosophy of nature: Selections from his writings (p. 42). New York: Hafner Library of Classics, 1953.

Rahman, F. (1998). *Health and medicine in the Islamic tradition*. Chicago: ABC International Group, Inc./Kazi Publications.

Schuster, M. A., Stein, B. D., Jaycox, L., Collins, R. L., Marshall, G. N., Elliott, M. N., et al. (2001). A national survey of stress reactions after the September 11, 2001, terrorist attacks. *New England Journal of Medicine, 345*(20), 1507–1512.