

Spirituality and Health: What's the Evidence and What's Needed?

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ABSTRACT

In this article, we familiarize readers with some recent empirical evidence about possible associations between religious and/or spiritual (RS) factors and health outcomes. In considering this evidence, we believe a healthy skepticism is in order. One needs to remain open to the possibility that RS-related beliefs and behaviors may influence health, yet one needs empirical evidence based on well-controlled studies that support these claims and conclusions. We hope to introduce the dismissing critic to suggestive data that may create tempered doubt and to introduce the uncritical advocate to issues and concerns that will encourage greater modesty in the making of claims and drawing of conclusions. We comment on the following questions: Do specific RS factors influence health outcomes? What possible mechanisms might explain a relation, if one exists? Are there any implications for health professionals at this point in time? Recommendations concern the need to improve research designs and measurement strategies and to clarify conceptualizations of RS factors. RS factors appear to be associated with physical and overall health, but the relation appears far more complex and modest than some contend. Which specific RS factors enhance or endanger health and well-being remains unclear.

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INTRODUCTION

Cultures throughout history have viewed health and disease as directly related to a variety of religious beliefs and practices, as evidenced by specific religious prescriptions concerning diet,

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physical activities, and quiet reflection and prayer (1,2). Ancient wisdom, situated within major religions, echo much of the message voiced by Hippocratic medicine in ancient Greece, the notion that lifestyle (including beliefs, emotions, and behaviors) powerfully influences health and risk of disease. Indeed, one can view Engel's seminal work in the 1970s calling for a biopsychosocial model (vs. one only focusing on biological factors) as a contemporary expression of ancient conceptions of health (3). (Note that we use the abbreviation RS throughout the article to signify "religious and/or spiritual" to save space. Spirituality, religiousness, and religion are often used interchangeably yet for many represent somewhat distinct, if not at times independent, constructs.)

Interest in possible relations between religion, spirituality, and health has attained the status of a "hot topic." Scientific audiences have become interested, with special issues on spirituality and health scheduled or published in scholarly journals (e.g., *American Psychologist*, *Journal of Health Psychology*). In 1997, the John Templeton Foundation in collaboration with the National Institute of Healthcare Research (NIHR) sponsored a series of conferences with medical and behavioral scientists to review the scientific evidence relating RS variables with physical health, mental health, alcoholism and other addictive disorders, and neurobiological factors (4). That effort helped trigger the Office of Behavioral and Social Sciences Research (OBSSR) at the National Institutes of Health (NIH) to establish a panel of behavioral scientists to critically review existing evidence presumably linking RS factors with health.

Reactions to the popularity of RS issues and to the notion that RS factors influence health outcomes have been varied. They tend to range from cynical skepticism on one hand (e.g., 5) to supportive advocacy on the other (e.g., 6). Benson (7), for example, contended that faith in God has health-promoting effects. Others, however, have argued that suggestions linking RS factors with better health are clearly unwarranted and warn against physicians involving spiritual and religious matters in their practice (8,9). Others have offered a less critical perspective on the quality of existing evidence linking RS factors to health and believe that health professionals need to consider this area in meeting ethical responsibilities to their patients (e.g., 10,11).

In this article, we seek to familiarize readers with some recent empirical evidence about possible associations between RS factors and health outcomes. In considering this evidence, we believe a healthy skepticism is in order. One needs to remain open to the possibility that RS-related beliefs and behaviors may indeed be important to health processes, in promoting and in endangering health. Yet one needs rigorous empirical evidence based on well-controlled studies that support these claims and conclusions. We hope to introduce the dismissing critic to suggestive data that may create tempered doubt. We also hope to in-

roduce the uncritical advocate (some might say the “cheerleader”) to issues and concerns that will encourage greater modesty in the making of claims and drawing of conclusions.

To facilitate more informed perspectives on both sides of the debate, we address briefly the following questions: Do specific RS factors influence health outcomes? Is there empirical evidence of sufficient quality to justify an answer to this question? What possible mechanisms might explain or account for a relation if one exists? Are there any implications for health professionals based on the evidence at this point in time?

We do not discuss here several possible explanations for the growing interest in the RS factor–health connection among the general population and among health professionals, and we do not comment on the common reluctance of many scientists to study RS factors, such as the belief that they cannot or should not be studied (see 12). We do offer a brief comment on how the terms *spirituality* and *religion* are used, but we omit a fuller discussion of definitional and conceptual issues. The background of earlier empirical research on RS factors and health, essentially underway since the mid 20th century, is also not presented. For extended treatments of these topics, the reader is referred elsewhere (12–19).

Comments on the scientific evidence that RS factors are associated with health status include the following:

- Some tentative conclusions about physical health from *Scientific Research on Spirituality and Health: A Consensus Report* (4).
- A consideration of four recent well-conducted epidemiological studies to provide the reader with a more concrete sense of the state of the science on RS factors and health.
- A comment on the few available experimental interventions.
- A brief consideration of some issues and concerns emerging from the current OBSSR/NIH panel on the state of scientific evidence concerning RS factors and health.
- A discussion of some research issues deserving attention.

Before considering the evidence, we briefly comment on the terms *spirituality* and *religion*, given the confusion often surrounding these constructs, with suggestions for further reading.

RELIGION AND SPIRITUALITY: SAME, SIMILAR, OR SEPARATE CONCEPTS?

Broadly speaking, the term *religion* is often viewed as a societal phenomenon, involving social institutions composed of members who abide by various beliefs and adhere to certain rules, rituals, covenants, and formal procedures. By contrast, a typical view of *spirituality* refers to the individual’s personal experience, commonly seen as connected to some formal religion but increasingly viewed as independent of any organized religion (13). However, the term *religiousness* is often used to convey the individual’s personal experience as part of an organized religion. William James (20), for example, used the term *relig-*

iousness in this way with focus on the personal attitudes, emotions, and personality factors.

The Oxford English Dictionary offers 10 pages of reference material on the concept of spirituality (21). Two related themes dominate this material. First, spirituality refers to life’s most animating or vital issues and concerns (e.g., the term *spiritus* in Latin means “the breath,” that which is most vital to life). Second, spirituality is seen as the more immaterial or subjective features of life, as distinct from the body or other more tangible and material things, including the senses, such as sight and hearing.

Some contend that religion is the more inclusive concept, with spirituality as its major focus: “Religion is a search for significance in ways related to the sacred” (22, p. 11). Others contend that spirituality is the more inclusive term of which religion and religiousness may or may not be a part. We opt for the view that these constructs may be viewed as two overlapping circles (Venn diagrams), with spirituality being the larger circle yet sharing with religion many overlapping areas, but each having nonoverlapping areas (23). As such, spiritual matters often concern seeking meaning and purpose in life, as well as those experiences which provide, for example, a greater sense of inner peace, harmony, hopefulness, and compassion for others and oneself. We suspect, however, that spirituality, if it is to mean something more than any idiosyncratic personal belief, involves seeking a sense of being or becoming connected to something greater than just oneself (e.g., “beyond the ego”) (24), something that provides a sense of the sacred or holy. For further discussion of these cultural, social, psychological, and theological issues, see Pargament (25). Also see Woods and Ironson (26) and Shahabi and colleagues (this issue/27) for empirical studies of health-related differences between those identifying themselves as only spiritual or only religious or as both or neither. We comment on prevalence in the United States of religiousness and spirituality later in this article.

WHAT IS KNOWN ABOUT THE RS FACTOR–HEALTH CONNECTION?

Interesting if not surprising associations between religious involvement, broadly defined, and health has been reported. Until very recently, the vast majority of the research examining potential relations between religious factors and physical health status, including mortality, has been cross-sectional in nature. Note that almost all of the research conducted to date has focused on religion or religiousness, not on spirituality seen as somewhat or completely independent from religion. Essentially, there is at present no well-controlled data on spirituality, seen as independent of religion, and health. Furthermore, assessment of religious involvement has been almost always limited to a person’s reported affiliation with any organized religion (or the person’s particular denomination within a religion) or to the frequency of attendance at religious services. Occasionally, researchers have asked questions about the importance or meaningfulness to the person of religion or religious beliefs. Furthermore, assessments have been typically limited to one or a few questionnaire items administered on one occasion. We return to this highly restrictive perspective of RS factors, com-

menting on ways to improve assessment and evaluation in research.

Scientific Research on Spirituality and Health:

A Consensus Report: Physical Health (4)

In the NIHR consensus report, Matthews, Koenig, Thoresen, and Friedman (28) cited studies providing some evidence to link religious involvement, usually frequency of religious service attendance, with physical health factors, such as the following:

- Lower rates of coronary disease, emphysema, cirrhosis, and suicide (29).
- Lower blood pressure (30).
- Lower rates of myocardial infarction (31).
- Improved physical functioning, medical regime compliance, and self-esteem and lower anxiety and health-related worries 1 year after surgery in heart transplant patients (32).
- Reduced levels of pain in cancer patients (33).
- Better perceived health and less medical service utilization (34).
- Decreased functional disability in the nursing-home-dwelling elderly (35–37).

Keep in mind that many of the studies cited were either cross-sectional in design or prospective (i.e., longitudinal) based on selective samples in terms of participants' characteristics (e.g., ethnicity, education, health status) and the area (e.g., the southeast region of the United States) from where they were drawn. In addition, these studies seldom used sufficient control measures or covariates known to influence health.

Lessons From Recent Well-Controlled Epidemiological Studies: Religious Attendance and Mortality

Because these issues, like other possible variables that could explain the reported relations linking more frequent religious service attendance with less disease, were not adequately taken into account, the results reported previously remain difficult to interpret. For example, cigarette smoking is clearly related to morbidity and mortality and is possibly associated with various markers of RS involvement. Failure to adequately control for smoking in any study involving RS factors and physical health raises doubt about what can be concluded about the role played by RS factors. Recently, researchers have focused on the use of state of the art epidemiological designs, often with fairly large population-based samples, to see if RS factors predicts health status, especially mortality, when many other factors related to health outcomes are included in the analysis.

Table 1 describes four such recently completed studies (38–41). Several things are noteworthy about these four studies, including the national sampling used in two of them and the effort in all to include many covariates (potential confounders) that could compete, so to speak, with the religious factors in the prediction of health outcomes. As can be seen from these studies, even with 12 or more control variables used in the analysis,

the higher frequency of attending services still independently predicted less all-cause mortality. Note that some of the covariates also independently predicted mortality (e.g., being married, better physical functioning of daily tasks, higher levels of social support, being female).

That these factors also independently predicted mortality highlights an important point about a specific RS variable: It may be one of many significant influential team players, but one not always on the field, in the influence of health and disease processes (42). Indeed, some of these independently significant factors may over time interact with each other to eventually alter disease risk (12). To illustrate, RS variables may influence opportunities to develop and maintain socially supportive relations, which in turn may reduce depression and moderate alcohol use, which in turn may help reduce undesirable physiological states, such as chronically elevated cortisol and norepinephrine levels. At present, this indirect or distal role remains speculative because empirical evidence is not available but could become available if changes are made in future research designs, statistical analyses, and assessment strategies. Note also that all four of these studies were conducted with reasonably healthy people, not patients with particular medical diagnoses. At present, the mechanisms linking religious variables and mortality for patients in large, well-controlled prospective studies remain unclear.

Hummer, Rogers, Nam, and Ellison (38) found that not attending religious service independently predicted a significantly higher risk of respiratory-related deaths as well as higher residual causes of mortality and a marginally higher chance of infectious and circulatory diseases. This study also demonstrated that compared to other significant independent risk factors, seldom or not attending services was associated with 50% more mortality than weekly attending services. The risk of not attending was only surpassed by the risks of heavy smoking (but not moderate or light smoking), being male, and self-reported poor overall health (63, 60, and 258% increased mortality rate, respectively). Note also that without any of the control factors used, non-attenders experienced 87% more mortality (hazard ratio [HR] = 1.87) than those attending services more than once a week, but this dropped to 50% more mortality in the model that used all of the control variables.

The study by Musick, House, and Williams (39) commendably attempted to unpack or disaggregate broad, complex dimensions such as "religious involvement." Perhaps the "tip of the iceberg" was revealed in this study by the use of various combinations of variables to best clarify possible RS factor and mortality relations. First, they found that religious involvement independently predicted mortality when social demographic factors were controlled. Then they discovered that once health behaviors (e.g., smoking, exercise) were entered in the analysis, religious involvement (a combination of attending services, praying, listening to religious TV programs, and reading scripture from the Bible) no longer independently predicted mortality. They then separated religious involvement into two categories: private and public religiousness. This resulted in religious service attendance (a public type of religiousness) predicting

TABLE 1
Recent Controlled Studies of Relations Between Religious or Spiritual Factors and Physical Health

<i>Study and Sample Characteristics</i>	<i>Control Variables</i>	<i>Results and Conclusions</i>
Hummer, Rogers, Nam, and Ellison (38): Epidemiological study of religious involvement and mortality, with an 8-year follow-up, in a sample of 21,204 U.S. adults. Primary predictor variable: Frequency of religious service attendance. Outcome variable: Mortality analyzed by cause of death.	1, 2, 3, 4, 5, 6, 7, 8, 9, 11	In the full model (all covariates included) across all cause-of-death categories, those who never attended services had an HR of 1.50 ($p < .01$); less than once a week had 1.24 ($p < .05$); and the weekly group had 1.21 ($p < .05$) over the more than once a week RG. In the full model at $p < .05$ level, those who never attended services were at greater risk for death from respiratory disease (HR = 2.11) and residual causes (HR = 2.42) than RG, and at marginally greater risk ($p < .10$) for circulatory and infectious diseases, cancer, diabetes, and external causes.
Musick, House, and Williams (39): Epidemiological study of religious involvement and mortality, with a 7.5-year follow-up, in a sample of 3,617 U.S. adults. Primary predictor variable: Frequency of religious service attendance. Outcome variable: Mortality	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, and other religious factors (theodicy/ beliefs)	In the full model, compared to the less than once a month RG, those who attended services one to three times a month had an HR of 0.75 (25% less); those who attended weekly had 0.65 (35% less); those who attended more than once per week had 0.61 (39% less). This relation was unexpectedly stronger among persons younger than 60 years of age. Other religious behaviors and beliefs did not explain, and sometimes suppressed, the inverse association between service attendance and mortality. For example, private religiousness suppressed the effects of public religiousness (attending services) on mortality. The need for more specific religious and spiritual factors was demonstrated.
Oman and Reed (40): A prospective study of religious service attendance and all-cause mortality over 5 years in a sample of 1,931 older residents of Marin County, CA. Primary predictor variable: Frequency of religious service attendance. Outcome variable: Mortality	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, and years of residence in county	In the full model, weekly attendees of religious services had lower mortality than nonattendees, RR = .72 (95% CI = 0.55, 0.93). Contrary to their hypothesis, religious attendance tended to be slightly more protective for those with high social support.
Strawbridge, Cohen, Shema, and Kaplan (41): Epidemiological study of religious involvement and mortality, with multiple assessments over 28 years, in a regional sample of 5,286 Alameda County, CA residents. Primary predictor variable: Frequency of religious service attendance. Outcome variable: Mortality, improvement in health practices, increased social contacts, and stable marriages.	1, 2, 3, 4, 6, 8, 9, 10, and religious affiliation	In the full model, frequent attendees of religious services had lower mortality than infrequent attendees (RH = 0.77; 95% CI = 0.64, 0.93); the effect was significant for women (RH = 0.66; 95% CI = 0.51, 0.86) but not for men (RH = 0.90; 95% CI = 0.78–1.15). At follow-up, frequent attendees were more likely to have stopped smoking, OR = 1.90 (95% CI = 1.27, 2.85); increased exercise, OR = 1.38 (95% CI = 1.08, 1.77); increased social contacts, OR = 1.50 (95% CI = 1.02, 2.21); and stable marriages, OR = 1.79 (95% CI = 1.36, 2.35).

Note. 1 = sex, 2 = age, 3 = health status, 4 = health behaviors, 5 = income, 6 = education, 7 = marital status, 8 = race/ethnicity, 9 = social support, 10 = mental health, 11 = geographic region, 12 = employment status; HR = hazard ratio; RG = reference group; RR = relative risk; CI = confidence interval; OR = odds ratio.

less death but private activities, such as watching religious TV and reading scripture, not being predictive. Instead, these private activities seemed to diminish the power of overall religious involvement (public and private types combined) to predict less mortality. Stated differently, private religiousness suppressed the association of public religiousness (service attendance) in predicting mortality. How this might be explained raises impor-

tant questions. One possibility might be that those engaging in private activities are less healthy physically, perhaps unable to attend services, and thus at greater risk of mortality. Another might be that those engaging in more private activities may differ from others in personality-related factors or other psychological characteristics (17,27).

Finally, the study of Strawbridge, Cohen, Shema, and Kaplan (41) demonstrated at least two major points. First, when both men and women were grouped together in the model including all control variables, frequent attenders had lower mortality rates than infrequent attenders (HR = 0.77, or 23% less mortality). However, this changed dramatically when men and women were considered separately: Frequent attendance was significantly associated with less death only in women (HR = 0.66; 95% confidence interval [CI] = 0.51, 0.86) but not in men (HR = 0.90; 95% CI = 0.70, 1.15). Second, this represents the only well-controlled study to date that has provided evidence using repeated measures revealing that changes in specific health behaviors (e.g., smoking, exercise) and social factors (e.g., frequency of social contacts, stability of marriages) were associated with a religious variable, in this case frequent attendance at religious services.

A recent follow-up study (43) examined gender differences in the maintenance of positive changes in physical and mental health factors. Men and women attending services weekly or more often were more likely to quit smoking, become more physically active, not get depressed, and increase their number of personal relationships. In terms of preventive actions, high attenders were less likely to avoid physical checkups, divorce, and decrease personal friendships and marginally less likely to become depressed.

In general, what is the evidence that RS variables predict health in controlled prospective studies that account for other possible factors? McCullough, Hoyt, Larson, Koenig, and Thoresen (42) provided a tentative answer. They conducted a meta-analytic review of religious involvement (including the four studies cited previously), mostly based on religious service attendance, and all-cause mortality. Twenty-nine different samples were used, involving 42 effect sizes and 18 control variables or covariates. These studies involved more than 126,000 participants. Although the independent effect size was modest (0.10), it was of the same magnitude in predicting all-cause mortality as depression, social support, excessive alcohol consumption, and the use of cholesterol-lowering drugs for those at high risk. Stated differently, those frequently attending religious services had approximately 29% fewer deaths from all causes when compared to those who were not religiously active (odds ratio [OR] = 1.29; CI = 1.20–1.39). Several other factors in the meta-analysis also independently predicted mortality risk, such as marital status, social support, perceived overall health status, and whether public or private measures were used (e.g., OR = 1.43 for public religiousness but only 1.04 for private religiousness). Evidence from any meta-analytic study, no matter how large the number of independent studies or total number of participants, is not without possible shortcomings. For an interesting exchange on how this meta-analysis on RS factors and health can be viewed in very different ways, see Sloan and Bagiella (44) and a reply by McCullough, Hoyt, and Larson (45).

Although these studies illustrate that frequency of religious service attendance has a nontrivial and nonrandom association with mortality, they do not demonstrate that attendance or religion in general caused mortality less often. Furthermore, a signif-

icant statistical relation in itself, such as one between greater attendance and reduced all-cause mortality, even if found within a prospective, well-controlled design, does not mean that religious attendance benefits everyone or even benefits most people (46). It does tell us that, on average, religious service attendance is associated with less mortality from all causes. It is not a random relation. However, such a relation in itself seldom sheds light on which persons may benefit more or less, and it does not clarify possible mechanisms or processes by which this happens.

These findings, although in many ways representing state of the art epidemiological studies, suggest several issues that deserve attention: First, more specific factors within the broader RS concepts currently used, such as religious involvement, must be assessed. One can readily conjecture, given the way constructs have been measured, that some RS factors and health relations may actually turn out to be much stronger, or much weaker, than current evidence suggests. Indeed, McCullough et al. (42) found significant variability among the 29 samples studied, such that generalizations need to be cautiously viewed. It is important that the examination of more specific features of RS factors may help clarify possible negative or harmful relations of religious factors and health, a topic that has received far too little attention in the empirical literature (this issue/27).

Second, the measurement of additional psychological factors within these studies is needed. Essentially, the use of well-established psychological concepts in this field of study has been “missing in action” (19,47). Assessing for more psychological factors would permit examination of possible interaction effects of certain person factors with certain religious factors (e.g., how narcissistic personality characteristics interact with religious attendance or with a person’s beliefs about God, such as a strict and punishing God vs. a loving and forgiving God).

Beyond Simple Baseline Predictions

Miller and Thoresen (13) observed that when predictor or control variables are related to each other, too often they fail to be considered for further study because they are found to be statistically insignificant in epidemiological studies. They suggested that experimental and repeated measures designs can answer many of the questions raised by epidemiological studies that are limited to the assessment of RS factors on a single occasion. Chatters (48) also made this point in discussing the existing literature on contextual factors in RS and health. Typically, most measures of context are used with the assumption that they will not change over time and that broad concepts, such as being religious, African American, or elderly, validly capture all persons assigned that label. Clearly, individual differences among any social, cultural, or ethnic grouping exist and may moderate any RS factor and health relation for better or for worse.

Results and Lessons From Experimental Studies

Unfortunately, relatively few experimental studies of RS factors and health exist. Worthington, Kurusu, McCullough, and Sandage (49) reviewed almost 150 studies that focused on RS

factors, counseling, and mental health. Roughly, only 7% involved experimental (vs. correlational or descriptive) designs. Experimental studies have been conducted primarily in the areas of meditation, almost always conducted within a secular rather than religious framework (e.g., 50), and prayer, mostly intercessory prayer in which one or more persons pray for the recovery of someone suffering from a serious chronic disease or disorder. Here, we comment on experimental studies examining the health-related effects of intercessory prayer. For a review of other RS-related health intervention studies, such as those examining meditation, religiously framed cognitive behavioral therapy, 12-step fellowship, and forgiveness interventions, the reader is referred to Harris, Thoresen, McCullough, and Larson (51) and Koenig, McCullough, and Larson (18).

Intercessory prayer and distant healing. In recent years, the effects of praying for others, often people unknown personally to those praying for them and living at a distance, have been studied with the use of randomized experimental designs. The results of these studies are intriguing and worthy of careful consideration. Here, we can only touch the surface (see 52).

Byrd (53) and Sicher, Targ, Moore, and Smith (54) reported double blind studies on the effect of intercessory prayer on mortality and morbidity outcomes. For example, among patients recovering from acute myocardial infarction, Byrd found that patients in the prayer condition did substantially better than control patients on a number of health-related outcome categories, such as having 7% fewer antibiotics required at discharge ($p < .005$) and 6% less need for intubations ($p < .002$). In addition, they had 6% less pulmonary edema ($p < .03$), 6% less congestive heart failure ($p < .03$), and 5% less cardiopulmonary arrest ($p < .02$), although these differences were less significant when adjusted at the experiment-wide $p < .05$ level.

In a replication of the Byrd study (53), published in *Archives of Internal Medicine* and involving 990 patients, Harris et al. (55) found that the prayed-for group in the coronary care unit (CCU) had significantly lower (11%) CCU Overall Course Scores than those with usual care. Course Score is an index of several major in-hospital procedures and outcomes, ranging from need for specific medications to bypass surgery, reinfarction, and death. However, the length and number of hospital stays did not differ significantly. It is important that researchers in this study controlled for response expectancy effects (56), which are often very powerful, by obtaining permission from their institutional review board not to inform anyone, including patients, about the prayer intervention. Thus, the attending physicians, nurses, and patients themselves all remained uninformed about the study.

Results such as these deserve attention. Although they do not shed light on how intercessory prayer works, they clearly provide evidence that the effects of prayer can be studied with empirical methods and can include objectively measurable and clinically important health outcomes. Not all intercessory studies, however, have demonstrated significant effects when experimental designs were used. Needed at this point is replication of such effects by other researchers using very similar procedures

and examining a broader range of person, health, and socio-demographic factors.

STATE OF THE SCIENTIFIC EVIDENCE: THE OBSSR/NIH PANEL

In 1999, the OBSSR in the NIH created an expert panel of social and behavioral scientists under the leadership of Norman Anderson and William R. Miller to report on the state of the science concerning RS factors and health. Here, we comment briefly on some current issues and concerns raised in the panel's work. (The panel's full report, composed of several articles, will be available in several months as a special issue of *American Psychologist*.)

The panel is organized into several working groups, covering areas such as physical health, measurement, possible psychosocial mediators, neurobiological pathways, and contextual factors. Of the many issues raised by the panel, a primary concern remains the limited quality of available studies in terms of research designs and assessments. Some of these issues have already been voiced in this article and by several others (4,8,19). For example, although cross-sectional studies can provide useful data in some areas, especially in the early stages of inquiry, prospective or longitudinal studies are essential to understand what changes over time. Cross-sectional snapshots are no substitute for real-time films. One's religious affiliation, such as Christianity or Judaism, may remain stable, but many specific factors associated with spirituality and religiousness may vary with circumstances and contexts over time.

A related issue cited by the panel is the absence, with rare exception, of experimental research in this area. Exceptions to date have been, as noted, in the area of intercessory prayer and meditation. Understanding RS factors more fully will require conducting more experimental studies that probe, for example, what factors when altered influence or mediate RS and health factors. Do RS factors, such as religious coping or beliefs about the nature of God, change as a result of a psychosocial intervention? If so, does the magnitude of a change in a RS factor relate to health changes?

What conclusions will the panel likely reach? Although not yet finalized, we suspect a modestly positive relation between RS factors and health will be reported, along with a host of caveats and concerns. The evidence to date will probably support the view that the association between some RS factors, especially frequent attendance at services, and health is neither trivial nor a random artifact. That is, the relation is not readily explained by several other known health-related factors, such as health behaviors (e.g., smoking), perceived social support or social networks, and various demographic factors. However, this relation could prove to be less positive when more sensitive and robust measures of various psychosocial and contextual variables, such as personality and specific dimension of spirituality or religiousness, are used.

RESEARCH ISSUES AND RECOMMENDATIONS

Several conceptual, methodological, and analytic issues are relevant to the improvement of RS factor research. Here, we build on what has been presented previously and elsewhere, briefly discussing some important issues and next steps in the

clarification of RS factor–health relations, including the possible mechanisms that underlie these relations.

The Value of a Behavior–Belief–Motivation–Experience Framework

Why does weekly religious service attendance predict less overall mortality in well-controlled studies (42)? How do we explain, for example, that service to others (“selfless service,” or volunteering in the community) predicts less mortality even when conventional risk factors, including social support, are controlled (57)? Answers to such questions based on empirical data require more detailed information regarding what persons involved in such studies are doing, thinking, and feeling (12).

Here are two examples that illustrate recent efforts to move away from large macro-level concepts (e.g., religious affiliation, denomination) toward the kind of specificity needed to unravel these relations. Pargament et al. (58) asked if certain kinds of religious coping might be associated with mental health and religious outcomes. Religious outcomes consisted of three items assessing the individual’s perceived changes in closeness to God, spiritual growth, and closeness that occurred as a result of coping with the impending surgery of a family member. They found that among family members waiting for a relative to undergo major surgery, those who used a “collaborating with God” style of religious coping, compared with a more self-directing or pleading-with-God style, had better coping outcomes and better religious outcomes. They also found that this collaborative coping style appeared to mediate the effects of depression and anxiety on psychological and religious outcomes, whereas other religious and secular kinds of coping (e.g., planning, instrumental social support) failed to do so.

Keefe et al. (59) examined RS factors among patients with arthritis and explored how they were related to daily positive and negative emotions (moods) as well as to experienced pain. They used an unusual research design in which each participant completed daily ratings of RS factors, mood and emotional states, social and emotional support, and pain level over 30 consecutive days. RS factors were studied in considerable detail in terms of daily spiritual experiences (e.g., “feeling deep inner peace or harmony”), RS coping (e.g., “looked to God for strength, support, and guidance”), RS efficacy (e.g., “extent my religious or spiritual coping allowed me to control my pain today”), and perceived salience of religion each day to pain management. The combination of daily spiritual experiences with perceived social support predicted the greatest increases in positive mood and the largest reductions in negative mood. Significantly, RS factors were clearly related to daily mood (positive and negative) and to RS efficacy.

When viewed independently, these factors may be misrepresented in how they indirectly exert influence on the experiences of people, such as pain. Through the use of a research design that revealed not only between-person differences but also within-person variability (in this case, from day to day over 30 days), a more complete and informative picture was produced. Interestingly, pain was at its lowest on those days when religious coping efficacy and daily spiritual experiences were higher,

even though daily spiritual experiences by themselves were not directly related to pain. Perhaps the changes in positive and negative emotions along with perceived RS efficacy were the active ingredients that led to reduced pain.

These two studies illustrate the value of working with more specific concepts, such as particular behaviors and beliefs, in more intensive ways than have been assessed in the past, to yield more useful data in terms of what may account for RS and health relations.

Health Hazards of RS Factors?

Are RS involvements or experiences associated with any undesirable physical or mental health outcomes? Although the preponderance of studies to date have reported health-enhancing findings (18,42), some researchers have found negative evidence (e.g., 60–62). For example, Exline, Yali, and Lobel (63) found that among believers of God (who were often religiously active), those who were unforgiving of God for some hurt or offense suffered more anxiety and depression. Galanter (64) reported serious mental health problems among those from a charismatic religious sect (“Moonies”). Pargament, Smith, Koenig, and Perez (65) looked at “negative religious coping” (e.g., expecting God to solve one’s problems) and found it to be associated with greater stress, depression, and suicidality.

Under some conditions, it seems likely that certain RS factors, as with social support or particular medications, may indeed be hazardous to health and well-being. Certain persons, for example, may experience serious physical and mental health problems that are associated with particular religious beliefs and practices. This may be especially true for beliefs and practices that are presented within a strict authoritarian framework, one that is intolerant if not hostile to any other perspective, religious or otherwise. Such frameworks may employ coercive and harsh forms of punishment, including social ridicule and shaming, and may foster pervasive feelings of guilt for any deviation or failure to comply. Booth (66) noted anecdotally that religious beliefs and practices, unfortunately, can take on serious addictive qualities, with persons becoming excessively anxious and dependent, which leads to a variety of health problems. Unfortunately, a clear and comprehensive picture based on well-controlled studies of the possible health-endangering correlates of RS factors is not yet available. Such a portrait will need to be provided with careful and sensitive attention to the many factors within and outside of RS factors that could explain possible health hazards and risks.

Implications for Professional Practice

Currently, with rare exception, health professionals receive little if any education in the possible role of RS factors in health and disease (67). This situation may be changing because over 50 medical schools are currently offering elective courses on religion and spirituality for medical students (see 68), and several nursing training programs offer some RS-related training, often centered around hospice care. This lack may be especially true in psychological training at any level (13,69). What training, if any, should psychologists and other related health professionals

receive? As noted, Sloan, Bagiella, and Powell (9) spoke out against including RS-related preparation for physicians. We believe, however, that the topic deserves at least some attention in professional training, given the evidence currently available. Others have written extensively on this topic, primarily on grounds that one's RS beliefs and practices can prove to be a potent factor in a person's lifestyle, influencing important choices, strivings, attitudes, and values, which in turn can influence health and disease risk (69,70).

At a minimum, we argue that health-related psychologists need to be at least introduced to the evidence linking RS-related factors to particular health outcomes, such as all-cause mortality. Furthermore, all should be informed of the prevalence of RS factors in the population, such as national and community survey data on RS beliefs and practices in the general population. This seems especially pertinent given the growing sensitivity in health care to multicultural issues in which RS factors often play an important role (60). Also, the discrepancy between health professionals and the general public in terms of their RS involvement, beliefs, and practices appears often to be substantial (67). As with several other issues related to RS factors, those of professional involvement need to be carefully considered and clarified.

Through What Mechanisms Might RS Factors Influence Health?

Different models have tried to explain the relation between RS factors and health outcomes. Four points deserve comment. First, several factors may be involved in mediating or moderating the pathways possibly connecting RS factors with health. The examination of univariate associations, or even single multivariate pathways, may be too simplistic. Second, any particular study would likely focus on only a slice of this RS factor–health conceptual pie (e.g., looking at the relation of a spiritual factor with selected health behaviors and physiological indicators). Third, some RS factors, as noted, under certain conditions could diminish or endanger health. It is unlikely that all RS factors would benefit health under all conditions for all people. Finally, any model at this point is highly likely to be flawed in several ways, given limitations in our current knowledge. Any conceptual model is at best a work in progress, subject to continual revision.

For example, Powell, Shahabi, and Thoresen (17) proposed a pathways model involving 10 major constructs, each with more specific subconstructs, including sociodemographic, person, cultural, religious–spiritual, and neurological and neuroendocrine processes leading to healing processes and, finally, to health as the end outcome. Unfortunately, empirical studies in this area to date have not been designed to test conceptual models or theory but have focused on whether relations exist between a RS factor and some health outcome

The Importance of Linking Conceptualization and Measurement

Religion and spirituality are complex, multidimensional constructs (71). In the design of studies and the use of relevant measurement tools, it is important to specify which features of

the constructs are being measured and to specify a theoretical rationale for doing so. Ellison and Levin (72) made a useful theoretical distinction between the functional and behavioral (or structural) features of religious involvement. They argued that it is the identification and measurement of the possible functional roles of religion, such as the provision of an existential framework of life meaning and purpose, specific coping strategies, or support for specific health behaviors, that will pay dividends in terms of the understanding of the mechanisms through which health is influenced. Most empirical studies have focused on behavioral or structural aspects of religious involvement, such as church attendance or rituals, and have not examined the functions that religious involvement may serve in people's lives. Pargament et al. (65) offered an example of a functional approach by examining different types of religious coping.

Other Research Design Issues

Research questions should dictate, as much as possible, the use of research designs. As our questions have become more sophisticated and precise, the need has developed to employ a greater variety of study designs. Other designs and methods, such as single-participant ($N = 1$) experiments (73); a variety of interview designs, including qualitative methods (see 74); daily monitoring methods (75); and controlled intervention studies have been largely missing. Particularly for health professionals interested in applying culturally sensitive, empirically validated treatments, intervention research offers the double benefit of the simultaneous development of effective treatment strategies and opportunities to test theoretical propositions concerning underlying mechanisms.

CONJECTURES AND CONCERNS

Conclusions about the emerging area of RS factors and health need to be highly tentative and stated in the spirit of reasoned conjectures based on suggestive evidence. The following conclusions seem justified at this point in time. We recognize, however, that some readers may find them overly cautious, whereas others may see them as excessively enthusiastic. We hope that they appear reasonable enough to encourage colleagues to take questions concerning the associations of RS factors and health seriously:

- A large number of Americans currently profess a belief in God (96%), attend religious services regularly (42%), consider their RS beliefs as very important in their lives (67%), associate frequent religious involvement with greater happiness (47%), and express the need for greater spiritual growth (82%). Given such data, RS factors deserve careful and critical consideration by health care professionals in research and training and in conventional and alternative or complementary health care practice (76,77). Keep in mind, however, that marked differences exist in various parts of the United States concerning most RS factors. For instance, whereas 42% of Americans nationwide attend services regularly, that figure drops to less than 20% in the San Francisco area and is over 60% in parts of the Southeast (78).

- RS factors appear to be associated with physical and overall health, but the relation may be far more complex and modest than some contend. Which specific RS factors enhance or endanger health remains unclear.
- Few studies have explored how spiritual factors may differ from religious factors with respect to health outcomes. Clarifying this distinction is a high priority because confusion about these terms obscures understanding and impedes research.
- Evidence linking frequent attendance at religious services to reduced all-cause mortality has been impressive, but the nature of and explanation for this relation remains unclear. In general, evidence from well-controlled prospective studies linking religious attendance to specific major diseases, such as various cancers (vs. all-cause mortality), remains insufficient.
- Missing in almost all major studies has been a more careful examination of person and psychological factors (except perhaps for social support, smoking, and perceived general health). Topics such as agentic and self-evaluative processes, including self- and collective efficacy beliefs, value orientations and personal strivings, and chronic emotional states (positive as well as negative emotions) in particular social situations deserve study. Such factors may prove to be powerful moderating or mediating variables in any RS factor and health relation.
- The need to use a much greater variety of research designs and assessment strategies and to combine more qualitative with quantitative methods seems imperative. Problems and questions need to dictate the selection of particular research designs and methods, not the other way around.
- Several RS-related factors that may benefit health or reduce disease risk, when engaged in as part of one's spiritual and religious orientation (rather than as secular activities), have yet to be studied. These include such topics as volunteering to help others, forgiveness, hope, and meditation. For example, over 12 forgiveness intervention studies have all used a secular perspective (80). What are, for example, the health advantages, if any, of framing a forgiveness intervention (or hope, meditation, etc.) within a spiritual or religious orientation compared to a secular one?

Perhaps the new millennium represents a fitting occasion for scholars and practicing professionals concerned with health to reconsider their perspectives on the role of RS factors in health. Very few, as noted, have received professional training on this topic. Yet it remains a major concern for many of those we serve and study. As with some issues of Church and State, matters of religion and spirituality often elicit strong involuntary, knee jerk reactions. We believe, however, that avoidance is not productive and that the time has come to address this topic candidly, with solid rigor and sensitive respect.

Advocacy has its place as does skepticism, but extremes of either seldom clarify the complexities. Too often, topics involving RS issues and health have fallen prey to reductionistic concepts, dichotomous thinking, and stereotyped images. The issues are indeed complex and challenging, but they are not insurmountable. We face the prospect, at least potentially, of reaping significant improvements in health care effectiveness, quality of life, and well-being if we proceed with sensitivity, pa-

tience, and perseverance. Einstein (80) may have been right when he noted that science without religion is lame, whereas religion without science is blind. Perhaps the same may also be true for spirituality and health.

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