

Weighing the Evidence: What Is Revealed by 100+ Meta-Analyses and Systematic Reviews of Religion/Spirituality and Health?



Doug Oman and S. Leonard Syme

Abstract This chapter reviews the more than 100 meta-analyses and systematic reviews of relations between religion/spirituality (R/S) and health that have been published in refereed journals, a far larger number than is generally recognized. The 118 published reviews identified by 2017 were categorized as quantitative meta-analyses ($n = 33$), qualitative meta-syntheses ($n = 7$), meta-analyses of case studies ($n = 1$), or simple systematic reviews ($n = 77$). They addressed a wide range of substantive topics relevant to every major public health subfield, and incorporated a mean of 33.5 studies per review. Collectively authored by more than 200 distinct individuals, the reviews were published in 83 different journals, 20 in the category of public health. Multiple reviews were published by 14 journals, a majority possessing impact factors above 2.0. Reviewing empirical studies of R/S-health is clearly a very broad-based enterprise not limited to a few individuals or journals. Collectively, the reviews greatly strengthen the case, based on Hill's criteria, that R/S exerts a causative influence on health. The case for causal influence may now be compelling, and in most cases R/S involvement is associated with better health, although negative associations also exist. Further investigation is warranted to explore the possibility that R/S is a "fundamental cause" of health that maintains an association even when intervening mediating pathways change. This possibility is consistent with the dynamic understandings of R/S presented elsewhere in this volume.

This chapter is one of thirteen reviews in this volume providing a public health perspective on the empirical evidence relating R/S to physical and mental health.

Keywords Public health · Spirituality · Religion · Systematic review · Meta-analysis · Causality · Hill's criteria · Fundamental cause · Physical health · Mental health

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When our research group at Berkeley's School of Public Health embarked on the series of empirical reviews that culminated in Part I of this volume, we knew from the recent *Handbook* by Koenig and his colleagues (2012) that there existed more than 3000 published studies of religion/spirituality (R/S) and health. We knew that the *Handbook* had systematically reviewed many of those studies in a way that was highly useful but had emphasized a clinical rather than a public health perspective. We also knew that there had been meta-analyses of a handful of other R/S-health topics, such as R/S engagement and longevity. As a crucial reference point for our own review, we wanted to identify all relevant pre-existing systematic reviews of relations between R/S factors and health variables. Therefore we embarked on searches of PubMed, PsycINFO, and other databases, expecting that we might find perhaps one or even two dozen published systematic reviews and meta-analyses of R/S-health relations.

We were astonished when we identified more than 100 refereed systematic reviews published about relations between religion/spirituality and one or more health-relevant variables. Not all of these systematic reviews were well-done or offered useful insights. But many were of high quality and had been published in journals with high impact factors. Many of these earlier reviews became useful building blocks that we cited in our own public health oriented reviews that appear in the preceding chapters in Part I of this volume. Along with the the two editions of Koenig and colleagues' (2001, 2012) *Handbook*, these reviews and meta-analyses enabled us to leverage our resources and cover a much broader and more comprehensive set of public health subtopics than would otherwise have been possible. As a result, we were able to assemble public health perspectives on evidence for R/S--health relations from the perspectives of virtually every major subfield within public health (see chapter "[Reviewing Religion/Spirituality Evidence from a Public Health Perspective: Introduction](#)" this volume).

Yet this massive body of systematic reviews also represents an important phenomenon in itself, a valuable resource for many researchers, practitioners, and academic educators interested in the relevance of religion/spirituality to public health. We therefore analysed the systematic reviews themselves as a body of scientific literature.

Our goal in the present chapter is to enable readers to use these 100+ systematic reviews efficiently, and understand their overall implications and potential for research, teaching, and practice. Accordingly, the next section tabulates and offers various overview statistics and perspectives about the reviews. The third section suggests some substantive implications for evaluating the causative aspect of R/S--health relations. The final section suggests needed future directions.

1 Overview of Systematic Reviews and Meta-Analyses

In December 2013 our Berkeley group conducted searches for reviews in refereed journals through PubMed as well as PsycINFO, Sociological Abstracts and seven other EBSCO databases,¹ without any restriction on date of publication. To meet the inclusion criterion of being *systematic*, each review was required to specify its search strategy (e.g., which databases) and enumerate the precise studies included in its final analyses. Our search terms specified that the title and/or abstract must refer to religion/spirituality.² We identified 599 unique records that were combined with 30 records in our files to yield 629 total records, reduced to 144 after inspection of abstracts, and to 128 after full-text retrieval and inspection.

The 128 retrieved systematic reviews were then divided into (i) reviews that focused on the association between R/S and a directly health-related variable such as health behaviors, social support, or mortality ($k = 77$); (ii) reviews of R/S and a variable such as education or personality, that is arguably but indirectly related to health ($k = 16$, e.g., Davis et al. 2013; Saroglou 2010); and (iii) reviews that were focused on methodological aspects of R/S-health relations, such as the frequency of R/S variables in studies published in top journals in a particular field, or reviews of measurement instruments ($k = 35$, e.g., Larson et al. 1986; Monod et al. 2011). In what follows, our primary focus is the first category concerning empirical findings about R/S-health relations.

Table 1 displays citation information for the 2013 list of 77 systematic reviews of R/S and directly health-related variables. The table also includes information about 41 additional systematic reviews identified subsequent to our original analyses, mostly published in 2014 or later (indicated by table footnote d). This combined (2017) total is 118 systematic reviews, meta-analyses, or qualitative meta-syntheses of relations between R/S and health-relevant variables.

Of the 2017 list of 118 reviews of direct R/S-health relations, 33 (28%) were quantitative meta-analyses, seven (6%) were qualitative meta-syntheses, one (1%) was a meta-analysis of case-studies, and 77 (65%) attempted neither qualitative nor quantitative aggregation, and might thus be called *simple systematic reviews* (SSRs). These reviews were published in a total of 83 journals, with multiple reviews appearing in 14 journals, a majority possessing impact factors above 2.0

¹The searched EBSCO databases focused primarily on social science: EconLit 1969 – current, Environmental Sciences and Pollution Management 1967 – current, ERIC 1966 – current, International Bibliography of the Social Sciences 1951 – current, PILOTS: Published International Literature On Traumatic Stress 1871 – current, PsycINFO 1806-current, Social Services Abstracts 1979 – current, Sociological Abstracts 1952 – current, Worldwide Political Science Abstracts 1975 – current.

²Strings for R/S specified “relig*,” “spiritu*,” or a term for a specific tradition such as “Christ*,” “Islam*,” “Buddhi*”; Strings for review specified “systematic* review*,” “meta-analy*,” or “meta-s*” (for meta-synthesis).

Table 1 Systematic reviews of religion/spirituality and health-related constructs (Refereed Journal Articles)

#	Type ^a	# Pubs ^b	References
<i>Health behaviors^{c,f,g}</i>			
			(see also reviews #37, #38, #39) ^q
#1	SSR ^{c,d}	33	Kendrick (2017). Are religion and spirituality barriers or facilitators to treatment for HIV: A systematic review of the literature. <i>AIDS Care</i> , 29(1), 1–13.
#2	SSR ^d	12	Castaldelli-Maia and Bhugra (2014). Investigating the interlinkages of alcohol use and misuse, spirituality and culture—insights from a systematic review. <i>International Review of Psychiatry</i> , 26(3), 352–367.
#3	SSR	2	Regan, Bhattacharyya et al. (2013). A systematic review of religion and dementia care pathways in black and minority ethnic populations. <i>Mental Health, Religion & Culture</i> , 16(1), 1–15.
#4	SSR ^c	43	Smolak, Gearing et al. (2013). Social support and religion: Mental health service use and treatment of schizophrenia. <i>Community Mental Health Journal</i> , 49(4), 444–450.
#5	SSR ^c	25	Coleman-Brueckheimer and Dein (2011). Health care behaviours and beliefs in Hasidic Jewish populations: A systematic review of the literature. <i>Journal of Religion and Health</i> , 50(2), 422–436.
#6	SSR ^c	43	Rew and Wong (2006). A systematic review of associations among religiosity/spirituality and adolescent health attitudes and behaviors. <i>Journal of Adolescent Health</i> , 38(4), 433–442.
<i>Substance abuse^e</i>			
#7	MA	22	Yeung, Chan et al. (2009). Youth religiosity and substance use: A meta-analysis from 1995 to 2007. <i>Psychological Reports</i> , 105(1), 255–266.
#8	SSR	105	Chitwood, Weiss et al. (2008). A systematic review of recent literature on religiosity and substance use. <i>Journal of Drug Issues</i> , 38(3), 653–688.
#9	MA	19	Alexander, Robinson et al. (1994). Treating and preventing alcohol, nicotine, and drug abuse through Transcendental Meditation: A review and statistical meta-analysis. <i>Alcoholism Treatment Quarterly</i> , 11(1–2), 13–87.
<i>Coping/adjustment/stress-related growth^e</i>			
			(see also #98)
#10	SSR ^d	9	Adedoyin A. C., Bobbie et al. (2016). Religious coping strategies among traumatized African refugees in the United States: A systematic review. <i>Social Work and Christianity</i> , 43(1), 95–107.
#11	SSR	73	Wortmann and Park (2008). Religion and spirituality in adjustment following bereavement: An integrative review. <i>Death Studies</i> , 32(8), 703–736.
#12	QMS	8	Yick (2008). A metasynthesis of qualitative findings on the role of spirituality and religiosity among culturally diverse domestic violence survivors. <i>Qualitative Health Research</i> , 18(9), 1289–1306.
#13	SSR ^c	32	Becker, Xander et al. (2007). Do religious or spiritual beliefs influence bereavement? A systematic review. <i>Palliative Medicine</i> , 21(3), 207–217.
#14	MA	49	Ano and Vasconcelles (2005). Religious coping and psychological adjustment to stress: A meta-analysis. <i>Journal of Clinical Psychology</i> , 61(4), 461–480.

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Table 1 (continued)

#	Type ^a	# Pubs ^b	References
<i>Dementia prevention or coping^{c,h}</i>			
			(see also #3)
#15	SSR ^d	11	Agli, Bailly et al. (2015). Spirituality and religion in older adults with dementia: A systematic review. <i>International Psychogeriatrics</i> , 27(5), 715–725.
#16	SSR ^d	13	Keast, Leskovar et al. (2010). A systematic review of spirituality and dementia in ltc. <i>Annals of Long-Term Care</i> , 18(10), 41–48.
<i>Psychological well-being: healthy populations^{e,h}</i>			
#17	MA	75	Yonker, Schnabelrauch et al. (2012). The relationship between spirituality and religiosity on psychological outcomes in adolescents and emerging adults: A meta-analytic review. <i>Journal of Adolescence</i> , 35(2), 299–314.
#18	SSR ^c	14	Weber, Pargament et al. (2012). Psychological distress among religious nonbelievers: A systematic review. <i>Journal of Religion and Health</i> , 51(1), 72–86.
#19	SSR	83	Hebert, Weinstein et al. (2006). Religion, spirituality and the well-being of informal caregivers: A review, critique, and research prospectus. <i>Ageing & Mental Health</i> , 10(5), 497–520.
#20	MA	28	Witter, Stock et al. (1985). Religion and subjective well-being in adulthood: A quantitative synthesis. <i>Review of Religious Research</i> , 26(4), 332–342.
<i>Prayer^e</i>			
			(see also #96)
#21	SSR ^d	12	Simão, Caldeira et al. (2016). The effect of prayer on patients' health: Systematic literature review. <i>Religions</i> , 7(1), 11.
#22	SSR ^d	10	Roberts, Ahmed et al. (2009). Intercessory prayer for the alleviation of ill health. <i>Cochrane Database of Systematic Reviews</i> , Article CD000368.
#23	MA ^f	15	Masters and Spielmans (2007). Prayer and health: Review, meta-analysis, and research agenda. <i>Journal of Behavioral Medicine</i> , 30(4), 329–338.
#24	SSR	17	Ernst (2003). Distant healing — an “update” of a systematic review. <i>Wiener Klinische Wochenschrift</i> , 115(7–8), 241–245.
#25	SSR	9	Townsend, Kladder et al. (2002). Systematic review of clinical trials examining the effects of religion on health. <i>Southern Medical Journal</i> , 95(12), 1429–1434.
#26	SSR	23	Astin, Harkness et al. (2000). The efficacy of “distant healing”: A systematic review of randomized trials. <i>Annals of Internal Medicine</i> , 132(11), 903–910.
<i>Mortality/Longevity^h</i>			
#27	MA	74	Shor and Roelfs (2013). The longevity effects of religious and nonreligious participation: A meta-analysis and meta-regression. <i>Journal for the Scientific Study of Religion</i> , 52(1), 120–145.
#28	MA	36	Chida, Steptoe et al. (2009). Religiosity/spirituality and mortality. <i>Psychotherapy and Psychosomatics</i> , 78(2), 81–90.
#29	MA	29	McCullough, Hoyt et al. (2000). Religious involvement and mortality: A meta-analytic review. <i>Health Psychology</i> , 19(3), 211–222.

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Table 1 (continued)

#	Type ^a	# Pubs ^b	References
<i>Physical health^h</i>			
#30	MA ^d	101	Jim, Pustejovsky et al. (2015). Religion, spirituality, and physical health in cancer patients: A meta-analysis. <i>Cancer</i> , 121(21), 3760–3768.
#31	SSR	38	Powell, Shahabi et al. (2003). Religion and spirituality: Linkages to physical health. <i>American Psychologist</i> , 58(1), 36–52.
<i>Crime & delinquencyⁱ</i>			
(see also #84)			
#32	MA	40	Cheung and Yeung (2011). Meta-analysis of relationships between religiosity and constructive and destructive behaviors among adolescents. <i>Children and Youth Services Review</i> , 33(2), 376–385.
#33	MA	60	Baier and Wright (2001). “If you love me, keep my commandments”: A meta-analysis of the effect of religion on crime. <i>Journal of Research in Crime & Delinquency</i> , 38(1), 3–21.
#34	SSR	40	Johnson, Li et al. (2000). A systematic review of the religiosity and delinquency literature: A research note. <i>Journal of Contemporary Criminal Justice</i> , 16(1), 32–52.
<i>Discrimination^j</i>			
#35	MA	55	Hall, Matz et al. (2010). Why don't we practice what we preach? A meta-analytic review of religious racism. <i>Personality and Social Psychology Review</i> , 14(1), 126–139.
<i>Environmental health^k</i>			
#36	CM ^d	48	Cox, Villamayor-Tomas et al. (2014). The role of religion in community-based natural resource management. <i>World Development</i> , 54, 46–55.
<i>Infectious diseases^l</i>			
(see also #1, #47, #57) ^q			
#37	SSR ^{c,d}	9	Lassiter and Parsons (2016). Religion and spirituality's influences on HIV syndemics among MSM: A systematic review and conceptual model. <i>AIDS and Behavior</i> , 20(2), 461–472.
<i>Nutrition^f</i>			
(see also #54, #55, #110, #111, #114)			
#38	SSR ^d	22	Akrawi, Bartrop et al. (2015). Religiosity, spirituality in relation to disordered eating and body image concerns: A systematic review. <i>Journal of Eating Disorders</i> , 3(1), 29.
#39	SSR	39	Tan, Chan et al. (2013). Religiosity and spirituality and the intake of fruit, vegetable, and fat: A systematic review. <i>Evidence Based Complementary and Alternative Medicine</i> , 2013, Article ID 146214.
<i>Family, youth, & reproductive outcomes^m</i>			
(see also #6, #7, #17, #32, #86, #87)			
#40	SSR ^c	87	House, Mueller et al. (2010). Character as a predictor of reproductive health outcomes for youth: A systematic review. <i>Journal of Adolescent Health</i> , 46(3, Suppl), S59–S74.
#41	MA	94	Mahoney, Pargament et al. (2001). Religion in the home in the 1980s and 1990s: A meta-analytic review and conceptual analysis of links between religion, marriage, and parenting. <i>Journal of Family Psychology</i> , 15(4), 559–596.

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Table 1 (continued)

#	Type ^a	# Pubs ^b	References
<i>Training or well-being of health professionals or religious leaders^g</i>			
#42	SSR ^d	6	Jafari (2016). Religion and spirituality within counselling/clinical psychology training programmes: A systematic review. <i>British Journal of Guidance & Counselling</i> , 44(3), 257–267.
#43	SSR ^d	28	Lewinson, McSherry et al. (2015). Spirituality in pre-registration nurse education and practice: A review of the literature. <i>Nurse Education Today</i> , 35(6), 806–814.
#44	SSR ^d	46	Paal, Helo et al. (2015). Spiritual care training provided to healthcare professionals: A systematic review. <i>Journal of Pastoral Care & Counseling</i> , 69(1), 19–30.
#45	SSR ^d	9	Doolittle (2015). Burnout, compassion fatigue, and job satisfaction among hospital chaplains: A systematic review. <i>Research in the Social Scientific Study of Religion</i> , 180–197.
#46	SSR	6	Nadarajah, Berger et al. (2013). Current status of spirituality in cardiac rehabilitation programs: A review of literature. <i>Journal of Cardiopulmonary Rehabilitation and Prevention</i> , 33(3), 135–143.
#47	SSR	2	Sorsdahl, Ipser et al. (2009). Interventions for educating traditional healers about std and HIV medicine. <i>Cochrane Database of Systematic Reviews</i> , CD007190.
<i>Spiritual well-being interventions at end of life^{g,n}</i>			
(see also #109)			
#48	SSR	35	Cobb, Dowrick et al. (2012). What can we learn about the spiritual needs of palliative care patients from the research literature? <i>Journal of Pain and Symptom Management</i> , 43(6), 1105–1119.
#49	SSR ^d	17	Fitchett, Emanuel et al. (2015). Care of the human spirit and the role of dignity therapy: A systematic review of dignity therapy research. <i>BMC Palliative Care</i> , 14(1), 8.
#50	SSR	5	Candy, Jones et al. (2012). Spiritual and religious interventions for well-being of adults in the terminal phase of disease. <i>Cochrane Database of Systematic Reviews</i> , CD007544.
#51	QMS ^c	19	Edwards, Pang et al. (2010). The understanding of spirituality and the potential role of spiritual care in end-of-life and palliative care: A meta-study of qualitative research. <i>Palliative Medicine</i> , 24(8), 753–770.
#52	QMS	11	Williams A.-L. (2006). Perspectives on spirituality at the end of life: A meta-summary. <i>Palliative and Supportive Care</i> , 4(4), 407–417.
<i>Referrals and adherence^{g,n}</i>			
(see also #1, #3, #37)			
#53	SSR ^d	7	Koehler Hildebrandt, Hodgson et al. (2016). Biopsychosocial-spiritual factors impacting referral to and participation in cardiac rehabilitation for African American patients: A systematic review. <i>Journal of Cardiopulmonary Rehabilitation and Prevention</i> , 36(5), 320–330.
<i>Programs for prevention or treatment^{g,o}</i>			
(see also #82, #115)			
#54	SSR ^{c,d}	5	Timmons (2015). Review and evaluation of faith-based weight management interventions that target African American women. <i>Journal of Religion and Health</i> , 54(2), 798–809.

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Table 1 (continued)

#	Type ^a	# Pubs ^b	References
#55	SSR ^d	27	Lancaster, Carter-Edwards et al. (2014). Obesity interventions in African American faith-based organizations: A systematic review. <i>Obesity Reviews</i> , 15, 159–176.
#56	SSR ^c	8	Hankerson and Weissman (2012). Church-based health programs for mental disorders among African Americans: A review. <i>Psychiatric Services</i> , 63(3), 243–249.
#57	SSR ^c	11	Williams M. V., Palar et al. (2011). Congregation-based programs to address HIV/AIDS: Elements of successful implementation. <i>Journal of Urban Health</i> , 88(3), 517–532.
#58	SSR	29	Ferguson, Wu et al. (2007). Outcomes evaluation in faith-based social services: Are we evaluating faith accurately? <i>Research on Social Work Practice</i> , 17(2), 264–276.
#59	SSR ^c	53	DeHaven, Hunter et al. (2004). Health programs in faith-based organizations: Are they effective? <i>American Journal of Public Health</i> , 94(6), 1030–1036.
<i>Organizational factors</i> ^{g,i}			
#60	SSR ^d	8	Pirkola, Rantakokko et al. (2016). Workplace spirituality in health care: An integrated review of the literature. <i>Journal of Nursing Management</i> , 24(7), 859–868.
<i>Treatments/interventions – individual</i> ^{n,o,p} (see also #101)			
#61	MA ^d	16	Anderson, Heywood-Everett et al. (2015). Faith-adapted psychological therapies for depression and anxiety: Systematic review and meta-analysis. <i>Journal of Affective Disorders</i> , 176, 183–196.
#62	MA ^d	23	Gonçalves, Lucchetti et al. (2015). Religious and spiritual interventions in mental health care: A systematic review and meta-analysis of randomized controlled clinical trials. <i>Psychological Medicine</i> , 45(14), 2937–2949.
#63	SSR ^d	10	Lim, Sim et al. (2014). Adapted cognitive-behavioral therapy for religious individuals with mental disorder: A systematic review. <i>Asian Journal of Psychiatry</i> , 9(20), 3–12.
#64	SSR ^d	6	Snider and McPhedran (2014). Religiosity, spirituality, mental health, and mental health treatment outcomes in Australia: A systematic literature review. <i>Mental Health, Religion & Culture</i> , 17(6), 568–581.
#65	SSR	8	Viftrup, Hvidt et al. (2013). Spiritually and religiously integrated group psychotherapy: A systematic literature review. <i>Evidence Based Complementary and Alternative Medicine</i> , 2013, 274625.
#66	SSR	25	Walpole, McMillan et al. (2013). Interventions for treating depression in Muslim patients: A systematic review. <i>Journal of Affective Disorders</i> , 145(1), 11–20.
#67	MA	46	Worthington, Hook et al. (2011). Religion and spirituality. <i>Journal of Clinical Psychology</i> , 67(2), 204–214.
#68	SSR	11	Paukert, Phillips et al. (2011). Systematic review of the effects of religion-accommodative psychotherapy for depression and anxiety. <i>Journal of Contemporary Psychotherapy</i> , 41(2), 99–108.
#69	MA	31	Smith, Bartz et al. (2007). Outcomes of religious and spiritual adaptations to psychotherapy: A meta-analytic review. <i>Psychotherapy Research</i> , 17(6), 643–655.

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Table 1 (continued)

#	Type ^a	# Pubs ^b	References
#70	SSR	16	Çoruh, Ayele et al. (2005). Does religious activity improve health outcomes? A critical review of the recent literature. <i>Explore: The Journal of Science and Healing</i> , 1(3), 186–191.
#71	MA	8	Kaplar, Wachholtz et al. (2004). The effect of religious and spiritual interventions on the biological, psychological, and spiritual outcomes of oncology patients: A meta-analytic review. <i>Journal of Psychosocial Oncology</i> , 22(1), 39–49.
#72	MA	26	Walker, Gorsuch et al. (2004). Therapists' integration of religion and spirituality in counseling: A meta-analysis. <i>Counseling & Values</i> , 49(1), 69–80.
#73	MA	5	McCullough (1999). Research on religion-accomodative counseling: Review and meta-analysis. <i>Journal of Counseling Psychology</i> , 46(1).
#74	SSR	148	Worthington, Kurusu et al. (1996). Empirical research on religion and psychotherapeutic processes and outcomes: A 10-year review and research prospectus. <i>Psychological Bulletin</i> , 119(3), 448–487.
#75	SSR	42	Worthington (1986). Religious counseling: A review of published empirical research. <i>Journal of Counseling & Development</i> , 64(7), 421–431.
			<i>Mental health & disorders</i> ^p
			(see also #4, #56)
#76	MA ^d	9	Wu, Wang et al. (2015). Religion and completed suicide: A meta-analysis. <i>PLoS ONE</i> , 10(6), e0131715.
#77	SSR ^d	89	Lawrence, Oquendo et al. (2016). Religion and suicide risk: A systematic review. <i>Archives of Suicide Research</i> , 20(1), 1–21.
#78	MA ^d	148	Salsman, Pustejovsky et al. (2015). A meta-analytic approach to examining the correlation between religion/spirituality and mental health in cancer. <i>Cancer</i> , 121(21), 3769–3778.
#79	MA ^d	14	Burns and Tomita (2015). Traditional and religious healers in the pathway to care for people with mental disorders in Africa: A systematic review and meta-analysis. <i>Social Psychiatry and Psychiatric Epidemiology</i> , 50(6), 867–877.
#80	SSR ^d	29	Cummings, Ivan et al. (2014). A systematic review of relations between psychotherapist religiousness/spirituality and therapy-related variables. <i>Spirituality in Clinical Practice</i> , 1(2), 116–132.
#81	SSR ^c	43	Bonelli and Koenig (2013). Mental disorders, religion and spirituality 1990 to 2010: A systematic evidence-based review. <i>Journal of Religion and Health</i> , 52(2), 657–673.
#82	SSR	1	Singh, Shah et al. (2012). The efficacy of mental health outreach programs to religious settings: A systematic review. <i>American Journal of Psychiatric Rehabilitation</i> , 15(3), 290–298.
#83	SSR ^d	70	Gearing, Alonzo et al. (2011). Association of religion with delusions and hallucinations in the context of schizophrenia: Implications for engagement and adherence. <i>Schizophrenia Research</i> , 126(1–3), 150–163.
#84	SSR	12	Eytan (2011). Religion and mental health during incarceration: A systematic literature review. <i>Psychiatric Quarterly</i> , 82(4), 287–295.

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Table 1 (continued)

#	Type ^a	# Pubs ^b	References
#85	SSR	6	Pesut, Clark et al. (2011). Religion and spirituality in the context of bipolar disorder: A literature review. <i>Mental Health, Religion & Culture</i> , 14(8), 785–796.
#86	SSR	115	Dew, Daniel et al. (2008). Religion/spirituality and adolescent psychiatric symptoms: A review. <i>Child Psychiatry & Human Development</i> , 39(4), 381–398.
#87	SSR	20	Wong, Rew et al. (2006). A systematic review of recent research on adolescent religiosity/spirituality and mental health. <i>Issues in Mental Health Nursing</i> , 27(2), 161–183.
#88	MA	147	Smith, McCullough et al. (2003). Religiousness and depression: Evidence for a main effect and the moderating influence of stressful life events. <i>Psychological Bulletin</i> , 129(4), 614–636.
#89	MA	35	Hackney and Sanders (2003). Religiosity and mental health: A meta-analysis of recent studies. <i>Journal for the Scientific Study of Religion</i> , 42(1), 43–55.
#90	MA	24	Bergin (1983). Religiosity and mental health: A critical reevaluation and meta-analysis. <i>Professional Psychology: Research & Practice</i> , 14(2), 170–184.
<i>Patient psychosocial well-being^a</i>			
#91	MA ^d	12	Kruizinga, Hartog, et al. (2016). The effect of spiritual interventions addressing existential themes using a narrative approach on quality of life of cancer patients: A systematic review and meta-analysis. <i>Psycho-Oncology</i> , 25(3), 253–265.
#92	MA ^d	78	Sherman, Merluzzi et al. (2015). A meta-analytic review of religious or spiritual involvement and social health among cancer patients. <i>Cancer</i> , 121(21), 3779–3788.
#93	SSR ^d	36	Bai and Lazenby (2015). A systematic review of associations between spiritual well-being and quality of life at the scale and factor levels in studies among patients with cancer. <i>Journal of Palliative Medicine</i> , 18(3), 286–298.
#94	SSR ^c	16	Mouch and Sonnega (2012). Spirituality and recovery from cardiac surgery: A review. <i>Journal of Religion and Health</i> , 51(4), 1042–1060.
#95	SSR	18	Schreiber and Brockopp (2012). Twenty-five years later—what do we know about religion/spirituality and psychological well-being among breast cancer survivors? A systematic review. <i>Journal of Cancer Survivorship</i> , 6(1), 82–94.
#96	SSR	26	Hollywell and Walker (2009). Private prayer as a suitable intervention for hospitalised patients: A critical review of the literature. <i>Journal of Clinical Nursing</i> , 18(5), 637–651.
#97	QMS	27	Lamb, Buchanan et al. (2008). The psychosocial spiritual experience of elderly individuals recovering from stroke: A systematic review. <i>International Journal of Evidence-Based Healthcare</i> , 6(2), 173–205.
#98	SSR ^c	17	Thune-Boyle, Stygall et al. (2006). Do religious/spiritual coping strategies affect illness adjustment in patients with cancer? A systematic review of the literature. <i>Social Science and Medicine</i> , 63(1), 151–164.
#99	MA	48	Sawatzky, Ratner et al. (2005). A meta-analysis of the relationship between spirituality and quality of life. <i>Social Indicators Research</i> , 72(2), 153–188.

(continued)

Table 1 (continued)

#	Type ^a	# Pubs ^b	References
#100	SSR	43	Lin H.-R. and Bauer-Wu (2003). Psycho-spiritual well-being in patients with advanced cancer: An integrative review of the literature. <i>Journal of Advanced Nursing</i> , 44(1), 69–80.
			<i>Patient sources of spiritual well-beingⁿ</i> (see also #15, #16)
#101	MA ^d	11	Chen, Xiao et al. (2017). The effects of life review on psycho-spiritual well-being among patients with life-threatening illness: A systematic review and meta-analysis. <i>Journal of Advanced Nursing</i> , 73(7), 1539–1554.
#102	SSR ^d	39	Gielen, Bhatnagar et al. (2016). Spirituality as an ethical challenge in Indian palliative care: A systematic review. <i>Palliative and Supportive Care</i> , 14(5), 561–582.
#103	SSR ^d	15	Piderman, Kung et al. (2015). Respecting the spiritual side of advanced cancer care: A systematic review. <i>Current Oncology Reports</i> , 17(2), 6.
#104	QMS	9	Hodge, Horvath et al. (2012). Older adults' spiritual needs in health care settings: A qualitative meta-synthesis. <i>Research on Aging</i> , 34(2), 131–155.
#105	QMS	11	Hodge and Horvath (2011). Spiritual needs in health care settings: A qualitative meta-synthesis of clients' perspectives. <i>Social Work</i> , 56(4), 306–316.
#106	QMS	10	Lin W.-C., Gau et al. (2011). Spiritual well-being in patients with rheumatoid arthritis. <i>Journal of Nursing Research</i> , 19(1), 1–12.
			<i>Doctor-patient conversationsⁿ</i>
#107	SSR ^{c,d}	61	Best, Butow et al. (2016). Doctors discussing religion and spirituality: A systematic literature review. <i>Palliative Medicine</i> , 30(4), 327–337.
#108	SSR ^{c,d}	54	Best, Butow et al. (2015). Do patients want doctors to talk about spirituality? A systematic literature review. <i>Patient Education and Counseling</i> , 98(11), 1320–1328.
			<i>Perspectives on end of lifeⁿ</i> (see also #48, #51, #52)
109	SSR ^d	45	Chakraborty, El-Jawahri, et al. (2017). A systematic review of religious beliefs about major end-of-life issues in the five major world religions. <i>Palliative and Supportive Care</i> , 15(5), 609–622.
			<i>Specific Religious Traditions</i> (see also #5, #18, #66, #79)
#110	MA ^c	35	Sadeghirad, Motaghipisheh et al. (2014). Islamic fasting and weight loss: A systematic review and meta-analysis. <i>Public Health Nutrition</i> , 17(2), 396–406.
#111	MA ^{c,d}	30	Kul, Savaş et al. (2014). Does Ramadan fasting alter body weight and blood lipids and fasting blood glucose in a healthy population? A meta-analysis. <i>Journal of Religion and Health</i> , 53(3), 929–942.
#112	SSR	22	Favazza Titus (2014). Seeking and utilizing a curandero in the United States: A literature review. <i>Journal of Holistic Nursing</i> , 32(3), 189–201.
#113	SSR	8	Shonin, Van Gordon et al. (2013). Mindfulness and other Buddhist-derived interventions in correctional settings: A systematic review. <i>Aggression and Violent Behavior</i> , 18(3), 365–372.

(continued)

Table 1 (continued)

#	Type ^a	# Pubs ^b	References
#114	SSR	36	Salim, Al Suwaidi et al. (2013). Impact of religious Ramadan fasting on cardiovascular disease: A systematic review of the literature. <i>Current Medical Research and Opinion</i> , 29(4), 343–354.
#115	SSR	7	Adedoyin C. (2013). A systematic review of the roles of congregations and faith-based organizations in the care and support of African Americans living with HIV/AIDS in the United States. <i>Social Work and Christianity</i> , 40(2), 184–205.
#115	SSR	101	Abu-Raiya and Pargament (2011). Empirically based psychology of Islam: Summary and critique of the literature. <i>Mental Health, Religion & Culture</i> , 14(2), 93–115.
#117	SSR	50	Lucchetti, Lucchetti et al. (2011). Complementary spiritist therapy: Systematic review of scientific evidence. <i>Evidence Based Complementary and Alternative Medicine</i> , 2011, 835945.
#118	SSR ^d	19	Fleming and Ledogar (2008). Resilience and indigenous spirituality: A literature review. <i>Pimatisiwin</i> , 6(2), 47–64.

^aTypes of systematic reviews include meta-analysis (MA) that calculates quantitative aggregate effect sizes, qualitative meta-synthesis (QMS) that identifies aggregate meta-themes, case-study meta-analysis (CMA) that identifies aggregate patterns in multiple case studies, and “simple” systematic review (SSR) that does not fall into any of the three “meta” categories. Criteria for inclusion were that a review (i) explains its systematic search strategy (e.g., which databases), (ii) reports the number of included publications or studies, and (iii) identifies individual included publications (e.g., in tables, references, supplements, etc.)

^bNumber of publications (e.g., studies) encompassed in each meta-analysis or other systematic review

^cPublished by journal classified as public health

^dIdentified post-2013 (not among original 77 systematic reviews), in some cases pertaining to factors more broadly related to health (i.e., #36, #60)

^eRelevant to chapter “Model of Individual Health Effects from Religion/Spirituality: Supporting Evidence” (this volume)

^fRelevant to chapter “Public Health Nutrition, Religion, and Spirituality” (this volume)

^gRelevant to chapter “Health Policy and Management, Religion, and Spirituality” (this volume)

^hRelevant to chapter “Religious/Spiritual Effects on Physical Morbidity and Mortality” (this volume)

ⁱRelevant to chapter “Social and Community-Level Factors in Health Effects from Religion/Spirituality” (this volume)

^jRelevant to chapter “Social Identity and Discrimination in Religious/Spiritual Influences on Health” (this volume)

^kRelevant to chapter “Environmental Health Sciences, Religion, and Spirituality” (this volume)

^lRelevant to chapter “Infectious Diseases, Religion, and Spirituality” (this volume)

^mRelevant to chapter “Maternal/Child Health, Religion, and Spirituality” (this volume)

ⁿRelevant to chapter “Clinical Practice, Religion, and Spirituality” (this volume)

^oRelevant to chapter “Public Health Education, Promotion, and Intervention: Relevance of Religion and Spirituality” (this volume)

^pRelevant to chapter “Mental Health, Religion, and Spirituality” (this volume)

^qOmitted from this table is Shaw and El-Bassel’s (2014) review of 137 empirical studies of HIV risk behaviors, which failed to describe its search strategy (violating tabular inclusion criteria), and would otherwise have been includable as an important review of health behavior (see summary in chapter on “Infectious Diseases, Religion, and Spirituality,” this volume)

^rMasters and Spielmans (2007) is an updating of Masters, Spielmans, et al. (2006)

Table 2 Published systematic reviews of religion/spirituality and health: (A) Journals Publishing Multiple Reviews, and (B) Public Health Journals

Impact ^a	Journal	No. ^b	References ^c
<u>(A) Journals that published multiple systematic reviews</u>			
0.977	<i>Journal of Religion and Health</i>	6	#5, #18, #54, #81, #94, #111
—	<i>Mental Health, Religion & Culture</i>	4	#3, #64, #85, #116
5.649	<i>Cancer</i>	3	#30, #78, #92
6.103	<i>Cochrane Database of Systematic Reviews</i>	3	#22, #47, #50
1.931	<i>Evidence Based Complementary & Alternative Medicine</i>	3	#39, #65, #117
3.685	<i>Palliative Medicine</i>	3	#13, #51, #107
1.231	<i>Journal for the Scientific Study of Religion</i>	2	#27, #89
3.838	<i>Journal of Adolescent Health</i>	2	#6, #40
1.917	<i>Journal of Advanced Nursing</i>	2	#100, #101
3.570	<i>Journal of Affective Disorders</i>	2	#61, #66
2.236	<i>Journal of Clinical Psychology</i>	2	#14, #67
2.230	<i>Palliative and Supportive Care</i>	3	#52, #102, #109
14.839	<i>Psychological Bulletin</i>	2	#74, #88
—	<i>Social Work & Christianity</i>	2	#10, #115
<u>(B) Public health journals that published systematic reviews^d</u>			
4.138	<i>American Journal of Public Health</i> (5, 16)	1	#59
3.838	<i>Journal of Adolescent Health</i> (7, 19)	2	#6, #40
3.685	<i>Palliative Medicine</i> (–, 23)	3	#13, #51, #107
3.063	<i>AIDS and Behavior</i> (13, –)	1	#37
2.814	<i>Social Science and Medicine</i> (15, 35)	1	#98
2.433	<i>Public Health Nutrition</i> (–, 49)	1	#110
2.335	<i>Psychiatric Services</i> (25, 51)	1	#56
2.232	<i>Patient Education and Counseling</i> (–, 57)	1	#108
2.046	<i>Journal of Urban Health</i> (–, 66)	1	#57
1.902	<i>AIDS Care</i> (49, –)	1	#1
0.979	<i>Community Mental Health Journal</i> (112, –)	1	#4
0.977	<i>Journal of Religion and Health</i> (113, –)	6	#5, #18, #54, #81, #94, #111

^a2015 impact factor (Thompson Reuters)

^bNumber of systematic reviews (when analyses finalized in early 2017)

^cReference number in Table 1

^dParentheses after journal name show rank-ordering of journal within Thompson/Reuters public health category (out of 153 in social science, out of 173 in science)

(see Table 2, top). Twenty of the 118 (17%) appeared in journals classified as public health (see Table 2, bottom). The mean number of publications examined in the 118 systematic reviews was 33.5, and was somewhat larger among meta-analyses (43.7) and somewhat smaller among qualitative meta-syntheses (13.6). Similar patterns were apparent in 2013 (see Fig. 1). Already in 2013, a total of 223 distinct individu-

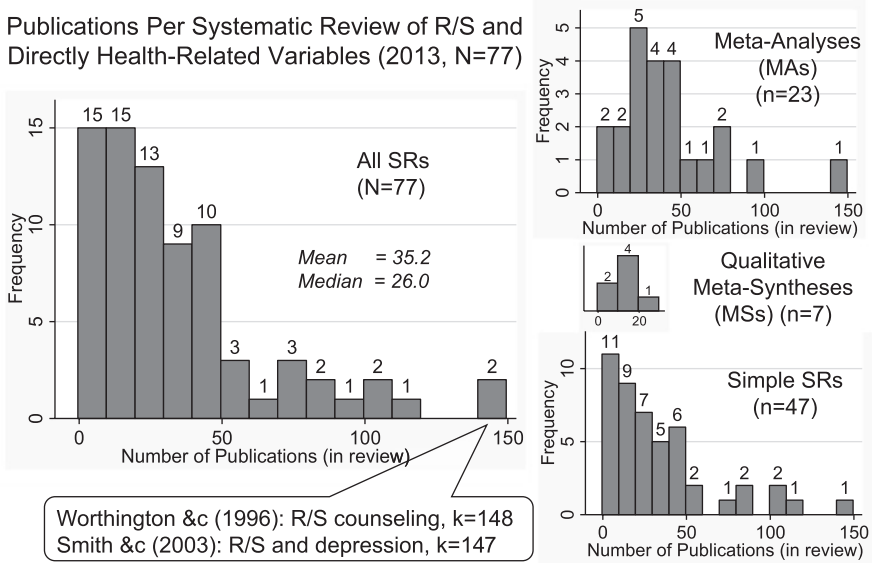


Fig. 1 Number of studies included in systematic reviews (SRs) of religion/spirituality (R/S) and health variables, by type of review (in reviews identified by 2013)

als were listed as authors, with only 18 individuals serving as author on multiple reviews, only one of whom authored or coauthored more than three reviews.³

The reviews addressed a wide range of substantive topics, as shown in the headers in Table 1. Of 118 empirical reviews published by 2017, at least one offered evidence relevant to each major public health subfield (i.e., earlier chapters in Part I of this volume, as indicated in footnotes e through p in Table 1). Many reviews are relevant to more than one public health subfield. Clearly, the process of systematically reviewing empirical studies of R/S-health relations is a very broad-based enterprise that is not limited to a few individuals, a few journals, or to the two editions of the *Handbook*.

Quality and Usefulness of Reviews Many reviews have appeared in high impact journals and reflect those journals’ high standards. Yet our group can also attest that the reviews listed in Table 1 varied considerably in their usefulness for preparing this volume. Some reviews are outdated, others identified only a very limited pool of relevant studies (e.g., #3, #47, #82), used poor methods, or contributed little new information beyond identification of studies. Every research literature is affected by

³Authors of multiple reviews in the 2013 list were Michael E. McCullough (5 reviews); Harold G. Koenig, Kenneth I. Pargament, and Everett L. Worthington (3 each); Hana Ayele, Edzard Ernst, David R. Hodge, Violet E. Horvath, David B. Larson, Hung-Ru Lin, Thomas Mulligan, Lynda H. Powell, Lynn Rew, Timothy B. Smith, Melinda A. Stanley, Carl E. Thoresen, Joel Y. Wong, and Jerf W. K. Yeung (2 each).

limitations of various kinds. Conditions that affect the quality of R/S-health reviews may include the complexity and interdisciplinary nature of the R/S-health topic, its capacity to galvanize rank-and-file enthusiasm despite its relative dearth of a stable funding base, and its relatively recent emergence as an organized literature. In view of such conditions, it is not surprising that a number of limitations exist. And despite this variety of adverse conditions, many reviews *are* solid, and much can be learned from them.

2 Does Religion/Spirituality Cause Health?: Implications of Systematic Reviews

What can we conclude from the findings embedded in these 100-plus reviews? Do the available meta-analyses and systematic reviews “prove” that religious and/or spiritual involvement fosters health?

Arguably most fundamental is the question of whether R/S engagement with religion/spirituality by an individual can have a causal effect on that same person’s health, through *any pathway*. For example, according to the “generic” model that is presented in this volume’s chapter entitled “[Model of Individual Health Effects from Religion/Spirituality: Supporting Evidence](#)”, engagement with R/S might plausibly benefit physical health through pathways that include improved health behaviors, heightened social support, enhanced mental health, and greater ability to draw strength from religious/spiritual methods of coping with stress. Many reviews and meta-analyses present evidence relevant to the primary question of whether R/S causally affects health through any pathway (e.g., Table 1, reviews #7, #17, #28, #30, #31).

Secondary causative questions of interest concern whether R/S engagement affects health through specific pathways or groups of pathways. For example, one may ask whether R/S causally affects health through enhanced social support. One may also ask whether R/S causally affects health through any pathways *apart from* enhanced social support – which would imply that benefits from R/S are not “just” social support. In popular discourse, such questions are commonly confused with the more fundamental causative question of whether religious/spiritual involvement may affect health through any pathway (Oman and Thoresen 2002). Happily, some meta-analyses do also present evidence relevant to specific secondary questions. For example, in 2009, Chida et al. (Table 2, review #28) reported that among 26 mortality studies in healthy populations that controlled for social support, R/S engagement predicted a statistically significant overall reduction of 16% in mortality risk after controls (hazard ratio [HR] = 0.84, 95%CI = 0.78–0.91). Such findings suggest that R/S effects on mortality are not mediated solely by social support. Similarly, some systematic reviews have separately tabulated, wherever possible, each study’s estimates from not only a “mediated model” that adjusted for potentially confounding factors, but also from an “independent model” that adjusted for confounders

plus “established risk factors” that include health behaviors, social support and mental health (i.e., depression) (p. 39 of Powell et al., review #31 in Table 1). Such studies do offer support for influence of R/S on health through all major generic pathways (for a fuller review of major pathways, see chapter “[Model of Individual Health Effects from Religion/Spirituality: Supporting Evidence](#)”, this volume).

Inferring Causality Without Randomization Rigorously gauging causal effects, however, remains a difficult task, because a person’s religious/spiritual engagement is largely incapable of being randomized, and randomized studies are often the easiest means of ruling out the possibility that an observed relation is an artifact of unobserved confounding factors. Even if it was ethical, a randomized study of religious engagement and health would likely pose intractable challenges for recruitment and adherence. But tobacco smoking and many other health factors also cannot be randomized, yet have come to be considered as causal. For such non-randomizable variables, how can causality be inferred?

Jeff Levin’s (1994) analysis of evidence for religion-health causality was published more than 20 years ago, but remains a valuable introduction to the issue. As he explains, British epidemiologist Austin Bradford Hill (1965) developed what have come to be known as “Hill’s criteria for causality” (Rothman and Greenland 2005). Since Hill viewed none of these nine “criteria” as either necessary or sufficient, they are perhaps better characterized as *perspectives* or *guidelines* for evaluating causality. These nine guidelines emerged from Hill’s pioneering work to infer the causal effects of smoking. Commonly studied by epidemiology students, these guidelines are often summarized as consistency, coherence, strength, temporality, plausibility, specificity, biological gradient, experiment, and analogy.

Based on the much smaller body of studies available in the early 1990s, Levin (1994) evaluated evidence for R/S-health causality from each of these perspectives. While none of the nine perspectives undermined arguments for causality, several possessed little relevant evidence, and Levin (1994, p. 1480) concluded that

the question, “Is it causal?“, can be answered with a “maybe”.... examining the evidence in light of Hill’s guidelines is inconclusive, but promising. Judging this literature in terms of consistency, plausibility, and analogy, the answer is yes. In terms of coherence, the answer is probably yes, but one cannot be certain. In terms of temporality and biological gradient, there is insufficient evidence, but recent gerontological findings may change this to a yes. In terms of strength and experiment, there is insufficient evidence. Finally, specificity does not seem to be applicable.

Now, more than 20 years later, after the publication of at least 2000 additional empirical studies and many dozens of meta-analyses and systematic reviews, is the answer still “maybe”? Pondering this question, we reread Levin’s paper, and noticed that the evidence base in many respects had expanded dramatically. What in 1994 could be addressed through only a small handful or a single study, can in 2017 in many cases be addressed through one or more meta-analyses or systematic reviews. Table 3 displays various ways that the case for causality has been strengthened, in many cases dramatically. Levin viewed the evidence for *consistency* as already strong, and for *coherence* as “probably yes” (p. 1480) – both can now be backed

Table 3 How systematic reviews change and strengthen the case for religion/spirituality's causative effects on health: change from 1994 to 2017

Hill guideline and year	Top of each pair: evaluation based on Levin (1994); Bottom: evaluation based on Relevant Systematic Reviews (2017)
Consistency? 1994	Levin (1994) concluded “yes” – There “can be no argument” (p. 1479) against consistency because of diversity of studies.
2017	Evidence now in 2017 further strengthened by multiple meta-analyses including #28 ^a : Chida et al. (2009, k = 36) ▶ R/S ↔ less adult mortality (18% reduction, i.e., Hazard Ratio[HR] = 0.82) #17 ^a : Yonker et al. (2012, k = 75) ▶ R/S ↔ less youth risk behavior ($r = -.17$) #7 ^a : Yeung et al. (2009, k = 22) ▶ R/S ↔ less youth substance abuse ($r = -.16$) #88 ^a : Smith et al. (2003, k = 147), ▶ R/S ↔ less depression ($r = -.10$) #89 ^a : Hackney and Sanders (2003, k = 35) ▶ R/S ↔ better mental health ($r = .10$) #99 ^a : Sawatzky et al. (2005, k = 48) ▶ R/S ↔ better quality of life ($r = 0.34$) Beyond systematic reviews, much international evidence, some from non-Abrahamic traditions, reports similarly favorable findings on many facets of R/S-health relations. ^{b, c}
Coherence? 1994	Levin concluded “probably yes” – “perhaps coherence is partly supported by research which suggests that elements of the proposed explanations (e.g., health behaviors, social support, health beliefs, emotional arousal) are associated with many of the disease outcomes examined in this literature in terms of risk, etiology, pathogenesis, and prognosis” (p. 1480).
2017	Evidence now in 2017 further strengthened by multiple meta-analyses including the reviews supporting <i>consistency</i> (section above), as well as: #32 ^a : Cheung & Yeung (2011, k = 40) ▶ R/S ↔ less youth delinquency, more constructive behavior ($r = .21$) #33 ^a : Baier & Wright (2001, k = 60) ▶ R/S ↔ less general crime ($r = -.12$) Meta-analytic evidence also supports perspectives asserting that R/S supplies distinctive added value #14 ^a : Ano & Vasconcelles (2005, k = 49) ▶ Positive R/S coping ↔ positive adjustment ($r = .32$) ▶ Negative R/S coping ↔ negative adjustment ($r = .22$)
Strength? 1994	Levin concluded evidence for strength was “insufficient” (p. 1480) – too few studies have been designed to gauge effect from religion, but “moderate to strong associations have been found in several studies” (p. 1479).
2017	Evidence now in 2017 for clinically relevant strength of association is available from multiple meta-analyses cited above, such as #28 ^a : Chida et al. (2009, k = 36) ▶ R/S ↔ less adult mortality (HR = 0.82, $p < 0.001$) The strength of the R/S-longevity association is comparable to the strength of many other factors deemed clinically relevant (Lucchetti et al. 2011; McCullough et al. 2001).

(continued)

Table 3 (continued)

Hill guideline and year	Top of each pair: evaluation based on Levin (1994); Bottom: evaluation based on Relevant Systematic Reviews (2017)
Temporality? 1994	Levin concluded evidence for temporal ordering was “insufficient” (p. 1480) because few longitudinal studies had been published.
2017	<p>Now in 2017, many meta-analyses and systematic reviews supply evidence in which the ostensible cause (R/S) precedes the effect (health). These include meta-analyses of mortality (#28 – see above) as well as randomized intervention studies of R/S-infused counseling and psychotherapy:</p> <p>#67^a: Worthington et al. (2011, k = 46)</p> <p>► R/S accommodative therapies outperformed both no-treatment controls ($d = .45$ in k = 22 studies) and alternate secular psychotherapies ($d = .26$ in k = 29 studies), and demonstrated favorable but nonsignificant trends when compared in dismantling designs ($d = .13$, ns, k = 11).</p> <p>The systematic review in Koenig et al.’s (2012) <i>Handbook</i>, though unrefereed, offers extractable information about longitudinal studies on multiple health outcomes, in most cases yielding much higher proportions of findings favorable versus unfavorable R/S-health associations.^a Similar patterns are extractable for some health behaviors, such as substance abuse:</p> <p>► R/S ↔ less alcohol abuse (of 31 high-quality prospective studies, R/S predicted less alcohol use/abuse/dependence in 26, with 5 null) (pp. 753–769)</p> <p>► R/S ↔ less drug abuse (of 22 high-quality prospective studies, R/S predicted less drug use/abuse/dependence in 20, with 2 null) (pp. 769–780)</p>

^aMeta-analysis

^bSee chapter “Religious/Spiritual Effects on Physical Morbidity and Mortality”, (this volume)

^cSee chapter “International and Global Perspectives on Spirituality, Religion, and Public Health”, (this volume)

with diverse meta-analyses. Evidence for *strength* was viewed by Levin as “inconclusive,” but clinically consequential relations are now backed by meta-analyses. Evidence for *temporality* was “insufficient” but now includes meta-analyses of topics such as mortality, as well as unrefereed yet high quality systematic reviews in the *Handbook* (Koenig et al. 2012).

From the standpoint of the Hill guidelines, the case for a causative relation between religion/spirituality and health has been enormously strengthened. On balance, we believe the case is compelling. Can anyone sincerely maintain that religion and spirituality are entirely non-causal epiphenomenal byproducts of other variables, and that all of the R/S-health relationships documented in Table 3, and in other systematic reviews listed in Table 1, are purely due to confounding?

Even as Hill-based assessments via systematic reviews are pointing increasingly strongly and perhaps compellingly toward causal effects, complementary causative evidence is also emerging from increasingly sophisticated individual studies. More specifically, innovative statistical methods now permit better estimates of robustness of certain estimates against unmeasured confounding (e.g., VanderWeele et al. 2016). A pioneering study that used such methods reported evidence for bidirectional effects between religious service attendance and depression that were of

approximately equal magnitude. The possibility of unmeasured confounding cannot be completely analytically eliminated in any nonrandomized design. But the investigators were able to infer that “for an unmeasured confounder to fully explain away the association of service attendance with subsequent depression, it would have to both increase the likelihood of service attendance and decrease the likelihood of depression by 2.1-fold, above and beyond the measured covariates, which may not be likely” (Li et al. 2016, pp. 881–882).

3 Future Directions

Even if the case for causative effects is regarded as compelling, many closely connected questions remain to be addressed. Perhaps most important, we believe the focus of attention should shift – and for many researchers has already shifted – from *whether* R/S exerts causative effects on health, to understanding *when* such effects are positive and favorable to health (apparently the most common effect), when they may be negative, and when causative influences are small or tend to cancel each other out. Such questions are important for designing optimal public health programs and interventions, activities that are already the focus of multiple systematic reviews (e.g., Table 1, reviews #54–#59, #61–#73).

Further insight may also be obtained by probing the secondary questions noted earlier about whether R/S-health relations are independent from or occur through particular subsets of mediating pathways. Support for major generic pathways such as R/S coping, enhanced mental health, and improved health behaviors, is now documented in systematic reviews and meta-analyses (e.g., reviews #14, #88, and *Handbook*, pp. 753–780, as analyzed in Table 1; for fuller discussion see also chapter “[Model of Individual Health Effects from Religion/Spirituality: Supporting Evidence](#)”, this volume).

A larger and more ambitious question is whether religion/spirituality might be a “fundamental cause” of health in the sense that they tend to “maintain an association with [health or] disease even when intervening mechanisms change” (Link and Phelan 1995, p. 80), a speculation offered nearly two decades ago by Hummer et al. (1999). The dynamic and evolving model of R/S that undergirds several chapters in this volume is compatible with such a view of R/S-health relations, and perhaps even required to accommodate the smaller but non-negligible presence of negative R/S-health associations in some circumstances (see chapter “[Social and Community-Level Factors in Health Effects from Religion/Spirituality](#)”, and Question 6 in chapter on “Questions on Assessing the Evidence Linking Religion/Spirituality to Health,” this volume).

Such a dynamic and evolving model, which assumes that religious traditions adapt and *learn*, need not imply uniformly positive learning-induced changes over time within each R/S tradition and its offshoots. In fact, in individual human development, U-shaped developmental trajectories “appear to be normative across developmental domains including language, cognition, and physical abilities and may be

a general property of dynamic systems.... [and may] signal periods of increased attention to new elements... and mark transitions to more complex integrations [and] newer levels of competence and complexity” (Nucci and Turiel 2009, p. 156). Religious/spiritual communities worldwide face the challenge of learning how to integrate essential R/S commitments and insights with the opportunities and disruptions of modern technology. Viewed from a dynamical systems perspective, inconsistencies in how religion/spirituality relate to health might reflect the irregularities inherent in how R/S-based behavior – like other human behavior – is “softly assembled... as a function of both... history and the current contexts” (Gershkoff-Stowe and Thelen 2004, p. 16).

By strengthening the case for causative R/S-health relations, the reviews examined in this chapter open up new questions and new theoretical and practical vistas. We believe that future work on R/S health should focus on both consolidation and expansion. Virtually every systematic review in Table 1 can offer some helpful information for future work, although the depth of the yielded insight varies greatly. As in every field, investigators must also use discernment to extract from each review the information that is based on solid methodological foundations. For many topics that are addressed by existing reviews, there is much scope for improved follow-up reviews that employ greater rigor, offer better insight into underlying patterns and processes, or offer meta-analytically aggregated estimates. Future work – individual studies as well as reviews, and by students as well as by senior researchers – should also attend to investigating and building theoretically cogent accounts of moderating factors that predict when R/S-health relations are stronger and more beneficial, when they are weaker or even negative, and how best to collaborate with R/S communities and enhance the health of their members. Up to now, the bulk of R/S-health work has been in individually oriented fields such as medicine and psychology. With its special concern for community-level perspectives and processes, public health can make an enormous contribution, and perhaps orchestrate increasingly sophisticated interdisciplinary collaboration to investigate religion, spirituality, and health.

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