Journal of Public Health
https://doi.org/10.1007/s10389-024-02303-1

REVIEW ARTICLE

Association of religiosity and spirituality with survival among older adults: a systematic review

Alessandra Buja[1] · Giulia Grotto[2] · Daniele Vo[1]

Received: 1 December 2023 / Accepted: 25 May 2024
© The Author(s) 2024

Abstract

Aim In a world where the aging population and prevalence of chronic degenerative diseases and life-threatening conditions have been increasing, identifying factors that can improve the living conditions of these populations is of paramount importance. The aim of the present research was to conduct a systematic literature review to investigate the impact of religion and spirituality on longevity.

Subject and methods Studies published in English that assessed the association between religiosity or spirituality and survival were identified by searching electronic databases (PubMed, PsycINFO, and CINAHL) and were independently reviewed by two authors.

Results A total of 13 prospective cohort studies were included in this review, including seven that found a negative association between religiosity and mortality and six that showed mixed results.

Conclusion Most studies highlighted the reduction in the risk of mortality, particularly among subjects who engaged in religious activities with an active social component. The linkage between religiosity and longevity might be mediated by the social support of the religious community, better health behavior, and mental health. However, most studies found a reduction in all-cause mortality even after adjusting for these mediating factors, indicating that other important mechanisms might have been involved.

Keywords Religion · Mortality · Longevity · Life span

Introduction

Over the last few decades, an important increase in the elderly population has been recorded, with the worldwide proportion of people aged 65 years and older increasing from 6.1% to 8.8% from 1990 to 2017 (Cheng et al. 2020). The elderly population is concentrated in more developed countries, which consequently face increasing prevalence of chronic degenerative diseases (United Nations 2020). In fact, older people are more affected by life-threatening diseases such as neoplastic pathologies (White et al. 2014) and heart failure (Bosch et al. 2019), which can severely reduce their quality of life and may lead to hopelessness, depression, and suicidal ideation (Uncapher et al. 1998). Thus, it is important to invest more resources to gain a deeper understanding of the health determinants that may help improve their quality of life and life expectancy by providing them with a sense of well-being, hope, and wholeness. In this context, religion and spirituality are two resources that can not only help improve the quality of life of the elderly population but also provide them with significant health benefits (Litalien et al. 2021).

Religiosity is a complex phenomenon characterized by two main dimensions (Allport and Ross 1967): intrinsic religiosity, which consists of the personal commitment to faith driven by the involvement of people in the principles of their religion, and extrinsic religiosity, which denotes the adherence to religion driven by the pursuit of personal benefits and social approval. On the other hand, spiritual well-being is defined as a sense of wholeness promoted by a fulfilling relationship with God, self, the community, or the

✉ Giulia Grotto
giulia.grotto.1@phd.unipd.it

[1] Department of Cardiological, Thoracic and Vascular Sciences, and Public Health, University of Padua, Via Loredan, 18-35127 Padua, Italy

[2] Department of Pharmaceutical and Pharmacological Sciences, University of Padua, Via Marzolo, 5-35131 Padua, Italy

Published online: 14 June 2024

environment (Ellison 1983). A study of the Pew Research Center's Forum on Religion and Public Life (Hackett et al. 2012) estimated that 84% of the world population had a religious affiliation. According to the bio-psychosocial model of health promoted by the World Health Organization since its foundation, and given the positive correlation between age group and religiosity/spirituality (R/S) habits (Stearns et al. 2018), we can underline the importance of further studies on its determinants of health, as it involves a large number of individuals. Interest in the health determinants of the elderly population has increased in recent years (Litalien et al. 2021). The aim of this systematic review was to estimate the association between people's exposure to R/S and longevity among older adults.

Methods

Search strategy and data extraction

For the present study, a systematic search was conducted on the PubMed, PsycINFO, and CINAHL databases to find observational studies that evaluated the association between R/S and survival, life expectancy, or all-cause mortality. Search strings were created by combining the keywords "Religiosity," "Spirituality," "Survival," "Mortality," "Life expectancy," "Old people," and "Older adult*" and their respective synonyms using Boolean operators. For the PubMed database, a combination of Medical Subject Headings (MeSH) terms and text words was used. The search strings are reported in Appendix A.

The retrieved studies were independently reviewed for eligibility by two authors (DV and GG) in a two-step process: an initial screening was performed according to titles and abstracts, and a second screening was then performed to assess the full texts. At both stages, disagreements between the two reviewers were resolved by consensus or, if the agreement was not reached, by consulting another author (AB). The reference lists of the included studies were also checked by the authors for any relevant articles not already considered.

A data extraction form based on the research question was created using Microsoft Excel. Data on the following study characteristics were collected: (1) author name, year, and country of publication; (2) study design and data sources; (3) sample size and characteristics; (4) measure of exposure; (5) measure of outcome; (6) results; (7) confounders; and (8) conclusions. We performed a descriptive analysis to report the characteristics of the included studies (Table 1).

Inclusion criteria

The following inclusion criteria were considered: studies that involved older adults (65+ years old or mean age of the sample of 65+ years), studies that reported measures of exposure (religiosity/spirituality) and outcome (survival, all-cause mortality, or life expectancy), and a measure of the association between exposure and outcome. Articles were excluded when not available in the English language. If multiple papers used data from the same study, only the most comprehensive was considered.

Methodological assessment

The methodological quality of the included studies was evaluated using the Newcastle–Ottawa Scale (NOS) for cohort studies (Wells et al. 2000). A score of at least 6 out of 9 indicated high quality, and the cutoff value for an adequate follow-up period was set a priori to 60 months (5 years), with a follow-up adequacy rate of 70%. All 13 included cohort studies were of high quality, with a mean NOS score of 7.8. The quality assessment results are reported in Appendix B.

Results

Identified studies

The search strategy returned a total of 238 citations from electronic databases. After removal of duplicates, 218 titles and abstracts were screened, and 32 full texts were assessed for eligibility, of which 13 met the inclusion criteria. None of the publications in the bibliographic references of the articles met the inclusion criteria. The literature search is shown in detail in Fig. 1.

Measures of exposure and outcome assessment

To quantify the exposure to religiosity, 11 studies asked for information about the subjects' religious attendance frequency (i.e., "How often do you usually attend religious services?") (Oman and Reed 1998; Hart 2001; Hill et al. 2005; Bagiella et al. 2005; Teinonen et al. 2005; Dupre et al. 2006; Zhang 2008; Schnall et al. 2010; Zeng et al. 2011; McDougle et al. 2016; Park et al. 2016), one asked whether they were part of a religious community (Fraser et al. 2020), two assessed their involvement in private religious activities such as prayer, meditation, or Bible study (Helm et al. 2000; McDougle et al. 2016), and one used a validated questionnaire to evaluate both religious attendance and spiritual peace (Park et al. 2016), namely the Brief Multidimensional Measure of Religiousness and Spirituality (BMMRS), which was first proposed by the Fetzer Institute in 1999 (Fetzer Institute/National Institute on Aging Working Group 1999).

Table 1 Characteristics of the included studies

Main author (year), country	Study design and data source	Sample size and characteristics	Measure of exposure	Confounders and mediators	Results
Bagiella et al. (2005), USA	Prospective cohort study. Data were collected from non-institutionalized populations aged 65 years and older, enrolled between 1980 and 1987 in the Epidemiologic Studies of the Elderly (EPESE)	Years 1980–1987. 14,456 non-institutionalized subjects aged 65+ years	**Type of religion**: Not specified. **Measure**: Religious attendance was assessed using the question, "About how often do you go to religious meetings or services?" (original questionnaire)	Gender, marital status, education, and cigarette smoking	Frequent religious attendance was associated with increased survival in the entire cohort (risk ratio [RR] = 0.78; 95% confidence interval [CI], 0.70–0.88). However, stratified analyses revealed that this association existed for only two of the four sites
Dupre et al. (2006), USA	Prospective cohort study. Data for this study were from a longitudinal sample of older adults (65+ years) who were selected as part of the EPESE. Each participant was interviewed at the time of enrollment (baseline) and at the yearly follow-ups over a period of 6 years	Years 1986/1987, 1989, 1992, and 1996. 4162 non-institutionalized subjects aged 65+ years who were from North Carolina	**Type of religion**: Not specified. **Measure**: Religious attendance was measured using the question, "About how often do you go to religious meetings or services?" (original questionnaire)	Education, marital status, social support, health status, and health behaviors	Religious attendance was found to be a strong predictor of mortality for both men and women. Results indicated that women who never attend religious services had an odds ratio (OR) of 1.60 [= exp(.47)] compared with frequent attenders (once per week or more), with men exhibiting a similar risk at 1.42 [= exp(.35)]
Fraser et al. (2020), USA	Comparison of two prospective cohort studies: the Adventist Health Study 2 (AHS-2) and Nonsmokers in United States Census Populations: The National Longitudinal Mortality Study (NLMS) and Its Surveillance, Epidemiology, and End Results Substudy	20,851 non-institutionalized subjects aged 70+ years who were recruited between 2002 and 2007. Average follow-up: 7.8 years	**Type of religion**: Seventh-day Adventists. **Measure**: Seventh-day Adventists' membership (value 0 or 1). The value of 1 denotes membership in the AHS-2 population, and 0 denotes membership in the NLMS population (original questionnaire)	Race, sex, education, and area of residence	All-cause mortality and all-cancer incidence rates in the black AHS-2 population were significantly lower than those for the black NLMS populations (hazard ratio [HR] for mortality, 0.64; 95% CI, 0.59–0.69; HR for cancer incidence, 0.78; 95% CI, 0.68–0.88). When races were combined, the estimated all-cause mortality was also significantly lower in the AHS-2 population at the ages of 65 years (HR, 0.67; 95% CI, 0.64–0.69) and 85 years (HR, 0.78; 95% CI, 0.75–0.81), as was cancer mortality

Table 1 (continued)

Main author (year), country	Study design and data source	Sample size and characteristics	Measure of exposure	Confounders and mediators	Results
Hart, (2001), USA	Prospective cohort study. Data were from the Cache County Study on Memory in Aging, which included non-demented older adults	3607 non-institutionalized subjects aged 65+ years who were recruited over a 5-year period	**Type of religion**: The Church of Jesus Christ of Latter-day Saints (LOS). **Measure:** Religious activity was measured using the question, "About how often do you attend religious services or activities?" (original questionnaire)	Age, gender, cardiovascular health, social contact, functional disability, and depression	On the basis of the hazard ratios obtained from the Cox regression models, it was found that subjects who attend church activities at least once a week or more were 41.6% less likely to die than subjects who attended church less frequently
Helm et al. (2000), USA	Prospective cohort study. Data were from the Duke University EPESE, which included a sample of elderly community-dwelling adults in North Carolina who were enrolled in 1986/1987	3851 community-dwelling subjects aged 65+ years who were enrolled in 1986; median follow-up period: 6.3 years	**Type of religion:** Protestant. **Measure**: Private religious activities were assessed using the question, "How often do you spend time in private religious activities, such as prayer, meditation, or Bible study?" (original questionnaire)	Physical and mental health, social connections, and health practices	For the activities of daily living (ADL) impaired group, the effect of private religious activities on mortality was not significant after controlling for demographic variables (HR, 1.11; 95% CI, 0.91–1.35). A significant survival advantage was found among the ADL unimpaired group (HR, 1.63; 95% CI, 1.20–2.21). This effect persisted after further controlling for explanatory variables, including health practices, social support, and other religious practices (HR, 1.47; 95% CI, 1.07–2.03)
Hill et al. (2005), USA	Prospective cohort study. Data were from the Hispanic Established Populations for EPESE baseline survey conducted in 1993–1994	3050 non-institutionalized subjects of Mexican origin aged 65 years and older. Baseline data were collected in 1993/1994. The original panel was recontacted in 1995/1996, 1998/1999, and 2000–2001	**Type of religion:** Not specified. **Measure:** Religious participation was evaluated by asking, "About how often do you go to mass or services?" (original questionnaire)	Sociodemographic characteristics, cardiovascular health, functional ability, social support, drinking, smoking, depression, cognitive functioning, and poor subjective health	Those who attended church once per week exhibited a 32% reduction in the risk of mortality compared with those who never attended religious services

Table 1 (continued)

Main author (year), country	Study design and data source	Sample size and characteristics	Measure of exposure	Confounders and mediators	Results
McDougle et al., (2016), USA	Prospective cohort study. Data were from the Wisconsin Longitudinal Study	1992–2009. 3146 non-institutionalized subjects aged 69–72 years	**Type of religion:** Not specified. **Measure:** The respondents were asked to report how religious they believed themselves to be, their religious attendance, and their use of religion-related coping strategies such as praying (individual form of coping) or attending religious services (social form of coping). (original questionnaire)	Employment status, income, and social embeddedness	Attending church more frequently was associated with a reduction in mortality risk ($b = -0.33$; $p = 0.006$; OR = 0.72; 95% CI, 0.57–0.91), while praying more frequently was associated with an increase in mortality risk ($b = 0.51$; $p = 0.001$; OR = 1.66; 95% CI, 1.26–2.20)
Oman and Reed (1998), USA	Prospective cohort study. The study population was a cohort of community-dwelling residents of Marin County, California	1584 community-dwelling subjects aged 65+ years (from a total population of 2023, aged 55+ years) who were first examined in 1990–1991. 5-year follow-up	**Type of religion:** Christian. **Measure:** Religious attendance was measured using a single question: "How often do you usually attend religious services?" (original questionnaire)	Demographics, health status, physical functioning, health habits, social functioning and support, and psychological state	After adjusting for all classes of variables, weekly attendance gave a protective relative hazard value of 0.72 ($p = .01$; occasional attendance was nonsignificant). Moreover, religious attendance tended to be slightly more protective for those with high social support
Park et al. (2016), USA	Prospective cohort study. Data were collected from patients with congestive heart failure who completed a baseline survey and were then followed up	191 patients recruited in 2007 (mean age: 68.6 years). 5-year follow-up	**Type of religion**: Not specified. **Measure**: Religious service attendance was evaluated using a single question: "How often do you attend religious services?" Spiritual Peace was assessed using a single item: "I feel deep inner peace or harmony." It was rated on a 6-point scale in terms of how frequently the respondent experiences this state. (BMMRS validated questionnaire)	Age, smoking, and alcohol consumption	A proportional hazard model showed that only spiritual peace (and not religious attendance) was significantly associated with reduced mortality risk (by 20%)

Table 1 (continued)

Main author (year), country	Study design and data source	Sample size and characteristics	Measure of exposure	Confounders and mediators	Results
Schnall et al. (2010), USA	Prospective cohort study. Data were from the Women's Health Initiative Observational Study, which examined the prospective association of religious affiliation, religious service attendance, and strength and comfort from religion with subsequent cardiovascular outcomes and death	22,451 non-institutionalized women aged 70–79 years. Average follow-up: 7.7 years	**Type of religion**: Christian majority, mostly protestant. **Measure:** Three questions asked about religious affiliation, frequency of religious service attendance, and the level of strength and comfort provided by religion. (original questionnaire)	Age, ethnicity, income, and education	Frequent religious service attendance and religious strength and comfort were associated with reduced risk of all-cause mortality (religious affiliation: HR, 0.84; 95% CI, 0.75–0.93; service attendance: HR, 0.80; 95% CI, 0.73–0.87; strength and comfort: HR, 0.89; 95% CI, 0.82–0.98)
Teinonen et al.(2005), Finland	Prospective cohort study. Data were from a population-based follow-up study of people aged 65 years or older who were living in Lieto, a semi-industrialized municipality in southwestern Finland	1080 non-institutionalized subjects aged 65+ years. 12-year follow-up	**Type of religion:** Christian (mostly Evangelical Lutheran Church of Finland). **Measure:** Religious attendance trichotomized into three groups (non-attenders, infrequent attenders, and frequent attenders). (original questionnaire)	Age, marital status, education, and smoking	Frequent religious attendance was related to lower mortality in women, but not in men. Among women, 48% of non-attenders, 38% of infrequent attenders, and 34% of frequent attenders died by the end of follow-up. The difference between the Kaplan–Meier curves was significant among the women ($p = 0.002$)
Zeng et al. (2011), China	Prospective cohort study. Data were from the 2002 and 2005 follow-up waves of the Chinese Longitudinal Healthy Longevity Survey (CLHLS)	2002–2005. 15,973 non-institutionalized subjects aged 65+ years	**Type of religion:** Not specified. **Measure:** Frequency of religious participation. The respondents were asked, "At present time, do you participate in religious activities regularly?" (original questionnaire)	Socioeconomic status, social ties, health practices, and prior health status	Risk of dying adjusted for baseline health was 21% ($p < 0.001$) lower among frequent religious participants than among non-participants Controlling for confounding variables notably reduced the magnitude of the degree of association, although religious participation remained significant for the total sample and for every subgroup except the oldest-old men

Table 1 (continued)

Main author (year), country	Study design and data source	Sample size and characteristics	Measure of exposure	Confounders and mediators	Results
Zhang (2008), China	Prospective cohort study. Data were from the 1998 and 2000 waves of the CLHLS	1998. 8805 non-institutionalized subjects aged 80–105 years. 2-year follow-up	**Type of religion:** Not specified. **Measure:** Religious participation. The respondents were asked how often they participated in religious activities (original questionnaire)	Psychological resources, health behaviors, and health status	For women, participating in religious activities significantly reduced their mortality risk over and above the controls for demographics and health status (HR, 0.82; $p=.006$). Similar patterns were found for individuals in poor health (HR, 0.79; $p=.009$), but not for men or for individuals in good health

Characteristics of the included studies

All the included publications were prospective cohort studies. Most of them (10/13) were conducted in the United States, one study was conducted in Finland (Teinonen et al. 2005), and two studies were conducted in China (Zhang 2008; Zeng et al. 2011). All the studies conducted in the United States focused mainly on a Caucasian sample, with two exceptions: the study by Dupre et al. (2006) involved whites and African Americans in an almost 1:1 proportion, and the study by Hill et al. (2005) included a population of Mexican origin. Overall, a small percentage of other ethnicities were studied. Fourteen of 15 studies involved men and women almost equally, whereas the publication by Schnall et al. (2010) included only women. One publication focused on patients with congestive heart failure (Park et al. 2016).

The sample sizes in the included studies ranged from 191 (Park et al. 2016) to 22,451 individuals (Schnall et al. 2010) older than 65 years. As three articles also examined younger individuals, only a subgroup analysis that focused on older adults was considered in the systematic review. Oman and Reed (1998) recruited subjects with ages starting from 55 years, and only the subgroup data for those older than 65 years were taken into account. In the study by Fraser et al. (2020), people aged 30 years and older were recruited, and only the subgroup of individuals older than 70 years were examined in this review. Schnall et al. (2010) enrolled individuals aged 50 years and older. Thus, a subgroup analysis of subjects aged 70 to 79 years was considered for the present study.

Study results

Table 1 reports the estimates of exposure and effect measures of the included studies. Among the 13 included studies, seven found a negative association between religiosity and mortality (Oman and Reed 1998; Hart 2001; Hill et al. 2005; Dupre et al. 2006; Schnall et al. 2010; Zeng et al. 2011; Fraser et al. 2020), and six showed mixed results (Helm et al. 2000; Bagiella et al. 2005; Teinonen et al. 2005; Zhang 2008; McDougle et al. 2016; Park et al. 2016). Of the seven articles that reported a negative association between religiosity and mortality, six were conducted in the United States and one was conducted in China (Zeng et al. 2011). Most study subjects described in the US publications were of Caucasian ethnicity (non-Hispanic whites), with the exception of those in one article (Hill et al. 2005), which included Caucasians and African Americans at a proportion of almost 1:1. In general, a high prevalence of Christian affiliation was reported. The study from China (Zhang 2008; Zeng et al. 2011) enrolled subjects from 22 provinces where Han ethnicity represented the vast majority (more than 90% of the total population). No data concerning the religious

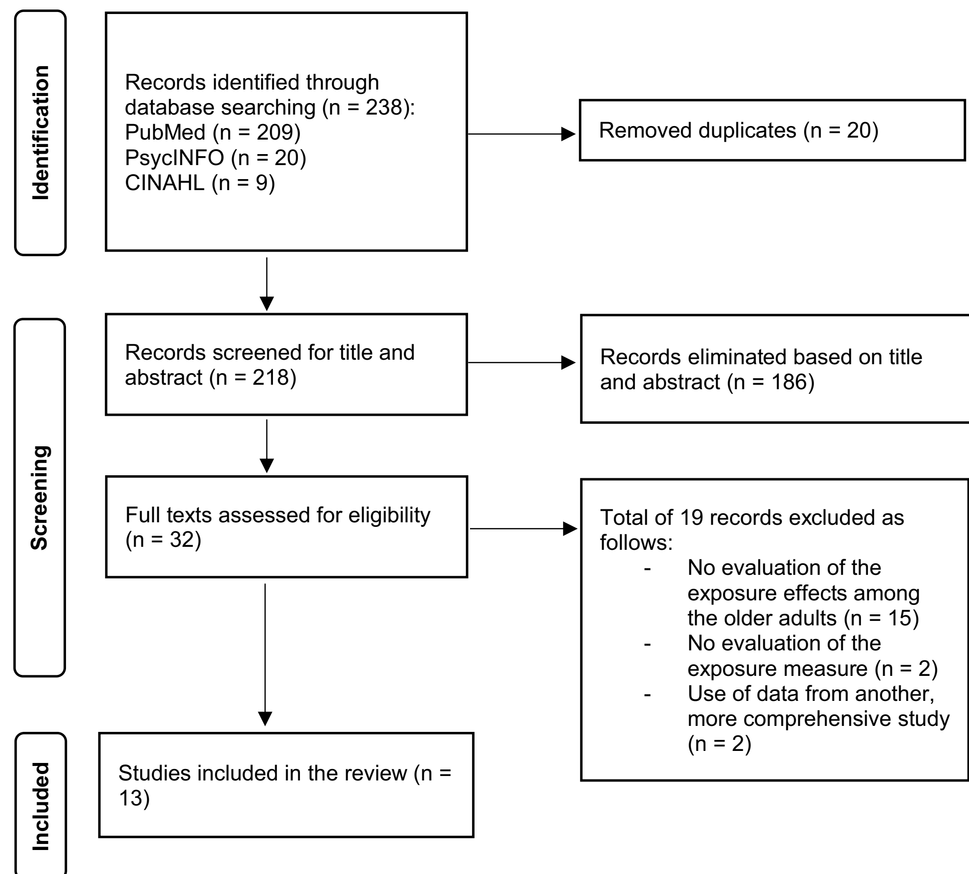

Fig. 1 Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram of the article search

affiliation of these subjects were provided, although the authors indicated Buddhism and Taoism as the two most important religious affiliations in the country.

Four of the six studies that showed mixed results were conducted in the United States (Helm et al. 2000; Bagiella et al. 2005; McDougle et al. 2016; Park et al. 2016); the remaining two took place in Finland (Teinonen et al. 2005) and China (Zhang 2008). Five of the six studies were conducted mainly with a Caucasian (non-Hispanic white) population; two involved samples whose main religious group was protestant (Helm et al. 2000; Teinonen et al. 2005), whereas four gave no information about religious affiliations (Bagiella et al. 2005; Zhang 2008; McDougle et al. 2016; Park et al. 2016), although three of these studies were conducted in the United States, which had a protestant majority (Bureau 2021), and the other one was conducted in China.

In the study by McDougle et al. (2016), religious attendance showed a negative association with mortality, although praying more to cope with stress was found to be positively associated with increased mortality. Park et al. (2016) found that subjects who experienced spiritual peace showed a lower mortality rate than those who did not, but no association was found between religiosity and mortality. Bagiella et al. (2005) found no consistent results, as only people from two of the four different samples showed a negative association between religiosity and mortality after adjusting for confounders. Helm et al. (2000) found that religious attendance was associated with a reduced mortality rate only in subjects without impairments in activities of daily living (ADL). Lastly, Teinonen et al. (2005) and Zhang (2008) demonstrated a negative association between religious attendance and mortality only among women. In addition, Zhang (2008) found similar results for individuals in poor health but not for those in good health.

Discussion

Overall, more than half of the included studies showed a negative association between religiosity and mortality. The other studies reported mixed results; that is, they found a significant negative association only for specific subgroups of the population (e.g., women) or components of the spiritual activities.

Several mechanisms have been hypothesized to explain the link between religious attendance and longevity. Among these mechanisms, the potential mediating factors of social support, health behavior, and mental health were the most studied (Hill et al. 2005). For instance, religious

attendance may reduce the risk of mortality, partly through the promotion of social contacts and social resources (Ellison and Levin 1998; George et al. 2002). In fact, people who regularly attend a religious community may benefit from greater social support, community involvement, and access to material and psychological help (Fraser et al. 2020), which can reduce stress and provide options for assistance that may also affect mortality (Ellwardt et al. 2015; Olaya et al. 2017).

Moreover, people who are more religious are likely to engage in healthier lifestyles (Ellison and Levin 1998; George et al. 2002). For example, religious involvement may deter drinking and smoking by increasing exposure to anti-abuse norms and peers and by reducing contact with deviant networks (Gorsuch 1995; Ellison and Levin 1998; Hill et al. 2005). Previous literature reviews also suggested that attendance at religious services is associated with better mental health and psychological well-being (Hackney and Sanders 2003), as religiously motivated expressions such as hope, forgiveness, altruism, and love have been proposed as psychological factors that may strengthen host resistance (Levin 1996) and satisfy the need for social contact and meaning in life (Oman and Reed 1998).

Although social support, mental health, and health behavior differences have often been suggested as the primary mechanisms of health benefit among religious people, several religious and mortality studies found that adjustments for those mediating factors did not fully account for the survival benefit that the religious participants received (Oman and Reed 1998; Koenig et al. 1999; Helm et al. 2000). This suggests that other important mechanisms that may connect religious involvement to reduced mortality are not yet understood.

Concerning the included studies that showed mixed results, two revealed gender-related differences, with religiosity being associated with better survival among women but not among men (Teinonen et al. 2005; Zhang 2008). The two studies were conducted in two countries, China and Finland, where the social component of religion is weaker than in other states. In particular, the fairly regularized religious lives typical of Western religions, characterized by attending weekly religious services and other activities, do not exist in China (Zeng et al. 2011), and Finland presents a large discrepancy between engagement in private prayer and public worship, with almost half of all Finns usually praying at least once a month, but only 14% of them attending religious services as often (Teinonen et al. 2005). Moreover, a previous meta-analysis revealed that the impact of religiosity on longevity was weaker in studies that used measures of private religious involvement (McCullough et al. 2000) and that the association between religious attendance and mortality was weaker among Finnish women than among the older population in the United States (Koenig et al. 1999), where the social component of religious activity is stronger. In addition, praying has been described as more helpful to females than males (Pargament 1997).

An interesting finding on the impacts of social religious activities was reported by McDougle et al. (2016) in their investigation of the effects of various coping strategies, including social (e.g., church attendance) and individual religious activities (e.g., prayer), on mortality risk. The participants were asked how often they typically sought comfort through praying or church attendance when they had problems or difficulties in their family, work, or personal life. As a result, a reduction in mortality risk was observed among people who attended church more frequently to cope with stress, whereas an increase in mortality risk was found among those who used prayer more frequently (McDougle et al. 2016). In other words, social approaches to religious coping appear to be more protective than individual approaches. This finding seems to support the protective role of social approaches to religion that may be a way for individuals to not only relieve their anxiety but also allow them an opportunity to obtain the relevant affirmations needed that will enable them to build their own coping abilities (McDougle et al. 2016). In general, it confirms the impacts that social integration and support can buffer against negative health outcomes (Thoits and Hewitt 2001).

On the other hand, Parks and colleagues reported that spiritual peace and not religious attendance was associated with lower mortality in a sample of patients with congestive heart failure (Park et al. 2016). This result is in line with a previous study that showed that the association between religiousness, particularly service attendance, and reduced risk of mortality was usually found in healthy subjects but not in populations already diagnosed with a serious disease (Chida et al. 2009). Similar results were obtained by Helm et al., who specifically investigated private religious activities and concluded that they had a protective effect only among participants with good functional ability and not among those with impaired performance in activities of daily living (Helm et al. 2000). One explanation proposed for this phenomenon is that religion may be more important in resisting disease than in helping people already diagnosed with a disease and undergoing treatment (Powell et al. 2003; Chida et al. 2009). However, spirituality was confirmed to be related to a lower mortality risk, even after considering many other variables (Park et al. 2016). The authors defined spirituality in terms of a sense of inner peace and harmony and focused specifically on the spiritual component of deep peacefulness (Park et al. 2016), which has been shown to be critically important to individuals with serious and life-limiting illnesses (Ironson et al. 2002; Steinhauser et al. 2006; Canada et al. 2008; Whitford and Olver 2012). This finding is consistent with those of other studies that linked spirituality and mortality in patients with serious illness, in which this inner experience of a sense of peace may matter most in terms of survival and exert the strongest protective effects on mortality risk (Ironson et al. 2002; Whitford and Olver 2012).

Limitations

This systematic review has several limitations. First, the number of studies that assessed the association between spirituality and mortality among older adults was small compared with the number of those that focused on religious attendance. Further studies are needed to better understand the possible link between spirituality and health status. Second, most of the included studies were conducted in the United States, where the Christian religion is predominantly practiced. Studies from other parts of the world and on other religious beliefs would broaden the generalizability of the results of the present study.

Conclusion

In conclusion, most studies conducted among older adults supported the protective role of religiosity or spirituality on longevity, particularly for religious activities with an active social component. The linkage between religiosity and longevity might be mediated by the beneficial effects of social support and better health behavior and mental health that often characterize religious people. However, because most studies found a reduction in all-cause mortality even after adjusting for the abovementioned confounding variables, other important mechanisms not yet understood might be involved.

Appendix A

PubMed search string

("old people"[Title/Abstract] OR "old adult*"[Title/Abstract] OR "old age"[Title/Abstract] OR "older people"[Title/Abstract] OR "older adult*"[Title/Abstract] OR "older age"[Title/Abstract] OR "geriatric"[Title/Abstract] OR "elder*"[Title/Abstract] OR "senior*"[Title/Abstract] OR older person*[Title/Abstract] OR old person*[Title/Abstract] OR aging adult*[Title/Abstract] OR aging person*[Title/Abstract] OR ageing adult*[Title/Abstract] OR ageing person*[Title/Abstract] OR geriatrics[Title/Abstract] OR senior*[Title/Abstract] OR "Aged"[Mesh]) AND ("Survival"[Title] OR "Mortality"[title] OR "Longevity"[Title] OR "Longevity"[Mesh] OR "Life Expectancy"[title] OR "Life Expectancy"[Mesh]) AND ("Religion"[Mesh] OR "Spirituality"[Mesh] OR "spiritual*"[Title] OR "faith*"[Title] OR "religio*"[Title]).

PsycINFO and CINAHL search string, EBSCO database

AB (old people or old adult* or old age or older people or older adult or older age or geriatrics or elder* or senior or older person* or old person* or aging adult* or aging person* or ageing adult* or ageing person* or geriatrics or senior* or aged) AND TI (survival or mortality or longevity or life expectancy) AND TI (religion or spirituality or spiritual* or faith* or religio*).

Appendix B

Table 2

Table 2 Quality assessment of the included studies using the Newcastle–Ottawa Scale for cohort studies (Wells et al. 2000)

Study ID	Selection				Comparability	Outcome			Total score
	Item 1	Item 2	Item 3	Item 4	Item 1	Item 1	Item 2	Item 3	
Bagiella et al. (2005)	1	1	1	0	2	1	1	1	8
Dupre et al. (2006)	1	1	1	0	2	1	1	1	8
Fraser et al. (2020)	1	0	1	0	2	1	1	1	7
Hart (2001)	1	1	1	0	2	1	1	1	8
Helm et al. (2000)	1	1	1	0	2	1	1	1	8
Hill et al. (2005)	1	1	1	0	2	1	1	1	8
McDougle et al. (2016)	1	1	1	0	2	1	1	1	8
Oman and Reed (1998)	1	1	1	0	2	1	1	1	8
Park et al. (2016)	1	1	1	0	2	1	1	1	8
Schnall et al. (2010)	1	1	1	0	2	1	1	1	8
Teinonen et al. (2005)	1	1	1	0	2	1	1	1	8
Zeng et al. (2011)	1	1	1	0	2	1	0	1	7
Zhang (2008)	1	1	1	0	2	1	0	1	7

Acknowledgements This paper was developed within the project funded by the NextGenerationEU"Age-It—Ageing Well in an Ageing Society" project (PE0000015), National Recovery and Resilience Plan (NRRP)—PE8—Mission 4, C2, Intervention 1.3. The views and opinions expressed are only those of the authors and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Authors' contributions AB conceptualized and supervised the draft of the manuscript; GG and DV wrote the main manuscript; all authors defined the research strategy; AB analyzed the conflicts among the two reviewers; all authors reviewed the manuscript and agreed to its published version.

Funding Open access funding provided by Università degli Studi di Padova within the CRUI-CARE Agreement. This paper was developed within the project funded by the NextGenerationEU "Age-It—Ageing Well in an Ageing Society" project (PE0000015), National Recovery and Resilience Plan (NRRP)—PE8—Mission 4, C2, Intervention 1.3. The views and opinions expressed are only those of the authors and do not necessarily reflect those of the European Union or the European Commission. Neither the European Union nor the European Commission can be held responsible for them.

Availability of data and materials The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Code availability Not applicable.

Declarations

Ethics approval and consent to participate Not applicable.

Consent for publication Not applicable.

Conflict of interest The authors declare no conflict of interest.

Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

References

Allport GW, Ross JM (1967) Personal religious orientation and prejudice. J Pers Soc Psychol 5:432–443. https://doi.org/10.1037/0022-3514.5.4.432

Bagiella E, Hong V, Sloan RP (2005) Religious attendance as a predictor of survival in the EPESE cohorts. Int J Epidemiol 34:443–451. https://doi.org/10.1093/ije/dyh396

Bosch L, Assmann P, de Grauw WJC et al (2019) Heart failure in primary care: prevalence related to age and comorbidity. Prim Health Care Res Dev 20:e79. https://doi.org/10.1017/S1463423618000889

Bureau UC (2021) Racial and ethnic diversity in the United States: 2010 Census and 2020 Census. In: Census.gov. https://www.census.gov/library/visualizations/interactive/racial-and-ethnic-diversity-in-the-united-states-2010-and-2020-census.html. Accessed 20 Sep 2023

Canada AL, Murphy PE, Fitchett G et al (2008) A 3-factor model for the FACIT-Sp. Psychooncology 17:908–916. https://doi.org/10.1002/pon.1307

Cheng X, Yang Y, Schwebel DC et al (2020) Population ageing and mortality during 1990–2017: a global decomposition analysis. PLoS Med 17:e1003138. https://doi.org/10.1371/journal.pmed.1003138

Chida Y, Steptoe A, Powell LH (2009) Religiosity/spirituality and mortality: a systematic quantitative review. Psychother Psychosom 78:81–90. https://doi.org/10.1159/000190791

Dupre ME, Franzese AT, Parrado EA (2006) Religious attendance and mortality: implications for the black-white mortality crossover. Demography 43:141–164

Ellison CW (1983) Spiritual well-being: conceptualization and measurement. J Psychol Theol 11:330–338. https://doi.org/10.1177/009164718301100406

Ellison CG, Levin JS (1998) The religion-health connection: evidence, theory, and future directions. Health Educ Behav off Publ Soc Public Health Educ 25:700–720. https://doi.org/10.1177/109019819802500603

Ellwardt L, van Tilburg T, Aartsen M et al (2015) Personal networks and mortality risk in older adults: a twenty-year longitudinal study. PLoS ONE 10:e0116731. https://doi.org/10.1371/journal.pone.0116731

Fetzer Institute/National Institute on Aging Working Group (1999) Multidimensional measurement of religiousness/spirituality for use in health research: a report of the Fetzer Institute/ National Institute on Aging Working Group

Fraser GE, Cosgrove CM, Mashchak AD et al (2020) Lower rates of cancer and all-cause mortality in an Adventist cohort compared with a US Census population. Cancer 126:1102–1111. https://doi.org/10.1002/cncr.32571

George LK, Ellison CG, Larson DB (2002) Explaining the relationships between religious involvement and health. Psychol Inq 13:190–200

Gorsuch RL (1995) Religious aspects of substance abuse and recovery. J Soc Issues 51:65–83. https://doi.org/10.1111/j.1540-4560.1995.tb01324.x

Hackett C, Grim B, Stonawski M (2012) Global religious landscape

Hackney C, Sanders G (2003) Religiosity and mental health: a meta-analysis of recent studies. J Sci Study Relig 42:43–55. https://doi.org/10.1111/1468-5906.t01-1-00160

Hart AD (2001) Religious activity and mortality in the elderly: the Cache County study. All graduate theses and dissertations

Helm HM, Hays JC, Flint EP et al (2000) Does private religious activity prolong survival? A six-year follow-up study of 3,851 older adults. J Gerontol A Biol Sci Med Sci 55:M400-405. https://doi.org/10.1093/gerona/55.7.m400

Hill TD, Angel JL, Ellison CG, Angel RJ (2005) Religious attendance and mortality: an 8-year follow-up of older Mexican Americans. J Gerontol B Psychol Sci Soc Sci 60:S102-109. https://doi.org/10.1093/geronb/60.2.s102

Ironson G, Solomon GF, Balbin EG et al (2002) The ironson-woods spirituality/religiousness index is associated with long survival, health behaviors, less distress, and low cortisol in people with HIV/AIDS. Ann Behav Med 24:34–48. https://doi.org/10.1207/S15324796ABM2401_05

Koenig HG, Hays JC, Larson DB et al (1999) Does religious attendance prolong survival? A six-year follow-up study of 3,968 older adults. J Gerontol A Biol Sci Med Sci 54:M370-376. https://doi.org/10.1093/gerona/54.7.m370

Levin JS (1996) How religion influences morbidity and health: reflections on natural history, salutogenesis and host resistance. Soc Sci Med 1982 43:849–864. https://doi.org/10.1016/0277-9536(96)00150-5

Litalien M, Atari D, Obasi I (2021) The influence of religiosity and spirituality on health in Canada: a systematic literature review. J Relig Health 61. https://doi.org/10.1007/s10943-020-01148-8

McCullough ME, Hoyt WT, Larson DB et al (2000) Religious involvement and mortality: a meta-analytic review. Health Psychol Off J Div Health Psychol Am Psychol Assoc 19:211–222. https://doi.org/10.1037/0278-6133.19.3.211

McDougle L, Konrath S, Walk M, Handy F (2016) Religious and secular coping strategies and mortality risk among older adults. Soc Indic Res 125:677–694

Olaya B, Domènech-Abella J, Moneta MV et al (2017) All-cause mortality and multimorbidity in older adults: The role of social support and loneliness. Exp Gerontol 99:120–126. https://doi.org/10.1016/j.exger.2017.10.001

Oman D, Reed D (1998) Religion and mortality among the community-dwelling elderly. Am J Public Health 88:1469–1475. https://doi.org/10.2105/AJPH.88.10.1469

Pargament KI (1997) The psychology of religion and coping: theory, research, practice, 1st edn. Guilford Pres

Park CL, George L, Aldwin CM et al (2016) Spiritual peace predicts 5-year mortality in congestive heart failure patients. Health Psychol Off J Div Health Psychol Am Psychol Assoc 35:203–210. https://doi.org/10.1037/hea0000271

Powell LH, Shahabi L, Thoresen CE (2003) Religion and spirituality: linkages to physical health. Am Psychol 58:36–52. https://doi.org/10.1037/0003-066X.58.1.36

Schnall E, Wassertheil-Smoller S, Swencionis C et al (2010) The relationship between religion and cardiovascular outcomes and all-cause mortality in the women's health initiative observational study. Psychol Health 25:249–263. https://doi.org/10.1080/08870440802311322

Stearns M, Nadorff DK, Lantz ED, McKay IT (2018) Religiosity and depressive symptoms in older adults compared to younger adults: moderation by age. J Affect Disord 238:522–525. https://doi.org/10.1016/j.jad.2018.05.076

Steinhauser KE, Voils CI, Clipp EC et al (2006) "Are you at peace?": One item to probe spiritual concerns at the end of life. Arch Intern Med 166:101–105. https://doi.org/10.1001/archinte.166.1.101

Teinonen T, Vahlberg T, Isoaho R, Kivelä S-L (2005) Religious attendance and 12-year survival in older persons. Age Ageing 34:406–409. https://doi.org/10.1093/ageing/afi107

Thoits PA, Hewitt LN (2001) Volunteer work and well-being. J Health Soc Behav 42:115–131. https://doi.org/10.2307/3090173

Uncapher H, Gallagher-Thompson D, Osgood NJ, Bongar B (1998) Hopelessness and suicidal ideation in older adults. Gerontologist 38:62–70. https://doi.org/10.1093/geront/38.1.62

United Nations (2020) UN decade of healthy ageing: plan of action 2021–2030. New York (NY): United Nations; 2020 (https://www.who.int/docs/ default-source/decade-of-healthy-ageing/final-decade-proposal/decade-proposal-final-apr2020-en.pdf?sfvrsn=b4b75ebc_5)

Wells G, Shea B, O'Connell D, et al (2000) The Newcastle–Ottawa Scale (NOS) for assessing the quality of non-randomized studies in meta-analysis

White MC, Holman DM, Boehm JE et al (2014) Age and cancer risk: a potentially modifiable relationship. Am J Prev Med 46:S7-15. https://doi.org/10.1016/j.amepre.2013.10.029

Whitford HS, Olver IN (2012) The multidimensionality of spiritual wellbeing: peace, meaning, and faith and their association with quality of life and coping in oncology. Psychooncology 21:602–610. https://doi.org/10.1002/pon.1937

Zeng Y, Gu D, George LK (2011) Association of religious participation with mortality among Chinese old adults. Res Aging 33:51–83. https://doi.org/10.1177/0164027510383584

Zhang W (2008) Religious participation and mortality risk among the oldest old in China. J Gerontol B Psychol Sci Soc Sci 63:S293-297. https://doi.org/10.1093/geronb/63.5.s293

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.