

Association of spirituality and quality of life in cancer survivors: A systematic review and meta-analysis

Jenny L. Firkins (✉ firkinsj@ohsu.edu)

Oregon Health & Science University

Ivana Tomic

Oregon Health & Science University

Lissi Hansen

Oregon Health & Science University

Christopher D. Woodrell


Icahn School of Medicine at Mount Sinai

Research Article

Keywords: cancer, health-related quality of life, oncology, quality of life, spirituality, meta-analysis, and systematic review

Posted Date: February 16th, 2024

DOI: <https://doi.org/10.21203/rs.3.rs-3911625/v1>

License:  This work is licensed under a Creative Commons Attribution 4.0 International License. [Read Full License](#)

Additional Declarations: No competing interests reported.

Abstract

Purpose:

Cancer is a leading cause of morbidity and mortality worldwide. Although people are living longer with cancer, cancer has the potential to negatively impact survivors' quality-of-life (QOL). Spirituality encompasses the concepts of transcendence, meaningfulness, faith, connectedness, and integrative energy. Spirituality is a part of everyday existence across cultures and religions and is a part of the human experience. Yet little has been published on spirituality in cancer survivorship. We were unable to find any previous reviews that examined the literature on the potential relationship between QOL and spirituality in cancer survivorship. Thus the aim of this systematic review and meta-analysis is to examine the current literature to more fully understand the relationship between spirituality and QOL.

Methods:

Using PRISMA guidelines, a systematic review and meta-analysis were conducted to examine the relationship between spirituality and QOL in cancer survivorship in studies sourced from PubMed, CINAHL, and PsycINFO databases.

Results:

Twenty-four articles, published between 2005 and 2023 were included for review. All studies included demonstrated a significant, positive correlation between QOL and spirituality with r values ranging from 0.15 to 0.817.

Conclusion:

Our findings suggest a positive correlation between higher spirituality and increased QOL among cancer survivors. Future research is needed to improve the understanding of this relationship and its mediators so that supportive oncologic interventions can be modified to address unmet needs and spiritual suffering. By better understanding the relationship between spirituality and QOL, we can move towards supporting the highest level of QOL possible for cancer survivors.

Full Text

Cancer is a leading cause of morbidity and mortality in the United States (U.S.) and worldwide [1, 2]. It is estimated that there are 17 million U.S. cancer survivors, almost 2 million of whom were diagnosed in 2023 [1]. It was estimated that there would be 609,820 cancer related deaths in the U.S. in 2023, making cancer the second leading cause of death in the U.S. [1]. Cancer continues to have a high mortality worldwide as well, with over 10 million cancer deaths worldwide in 2020 [2]. With an estimated 19.3 million new cancer diagnosis (excluding nonmelanoma skin cancer) worldwide in 2020, cancer is a global health concern [2].

Much of the focus on outcomes in cancer therapeutics research centers on overall survival and time until disease progression. However, cancer and its treatment can have a significant negative impact on the quality of life (QOL) of cancer survivors [3, 4]. Therefore, understanding the impact of cancer and its treatment on an individual and how it impacts QOL is a vital consideration in cancer survivorship to mitigate any threats to survivors' QOL where possible [5, 6]. QOL has been described as an overarching concept that includes all aspects of being [7]. The World Health Organization defined QOL as "a state of complete physical, mental, and social well-being" [8]. QOL can encompass the experience of life as a whole rather than from its parts [9].

In some QOL models, and for the purpose of this systematic review of the literature, spirituality is a core domain of QOL in cancer survivorship, along with physical, psychological, and social well-being [10]. Spirituality has been defined as "[arising] from an underlying state of spiritual health and is an expression of it, much like the color of one's complexion and pulse rate are expressions of good (physical) health." [11]. Spirituality is a multidimensional concept encompassing the components of transcendence, meaning and purpose, faith, and interconnectedness [11, 12]. For cancer survivors facing a potentially life-limiting diagnosis, thoughts about life, death, and meaning are prevalent, potentially affecting thoughts of meaning in their life and illness [13, 14].

Although many QOL models include a spirituality domain, current literature lacks a comprehensive and cohesive examination of the relationship between QOL and spirituality in cancer survivorship. A recent systematic review found that in adults with heart failure, spirituality correlated with a 20% reduction in mortality and that there was a potential relationship between spirituality and QOL in these adults [15]. Yet it is unknown if a similar relationship between spirituality and QOL exists in cancer survivorship. Thus, the aim of this systematic review and meta-analysis was to more completely understand the relationships between spirituality, QOL, and the domains of QOL as evidenced in the existing scientific literature. We completed a systematic review and meta-analysis with the objectives of

synthesizing and evaluating the previously published evidence of the relationship between the spirituality domain and overall QOL in cancer survivorship. A clear understanding of these relationships has the potential to identify key knowledge gaps, paving the way for the development of future research and interventions to optimize or maintain cancer survivors' spirituality and QOL.

Methods

This review and analysis were completed adhering to the guidelines provided by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses report (PRISMA) [16]. A literature search was conducted using CINAHL, PubMed, and PsycINFO databases. Search terms (See Appendix for search terms) and parameters were used based on a previously published systematic review examining spirituality and QOL in adults with a history of cardiovascular disease [17]. No constraint was placed on publication year, however no results met criteria for inclusion that were published prior to 2005, and the search was conducted ending on July 1, 2023. Search results were imported into Rayyan, a web-based blinded systematic review application, and duplicates were removed [18]. The reviewers (JF and IT) independently reviewed titles and abstracts of articles and identified those to be included. Inclusion criteria were: available in English, participants diagnosed with cancer as adults, reported a specific population of cancer survivors, contained measurements of both QOL and spirituality, and reported the completion of a quantitative correlation of spirituality and QOL. Only articles that specifically provided the correlation for spirituality and QOL were included in this review and meta-analysis. Qualitative studies, case studies, narrative reviews, commentaries, letters, and non-patient reported metrics were excluded due to our focus on the quantitative relationship of spirituality and QOL.

Full articles were obtained and reviewed by both reviewers who completed independent, *blinded* reviews. The independent reviews were *unblinded*, and consensus about articles that met inclusion criteria was reached (Fig. 1). Data were extracted (JF and IT) for relevant information including publication information, cancer type, geographic location, QOL assessment tool, spirituality assessment tool, sample size, sample demographics, mean QOL, and mean spirituality. Correlation coefficient scores of QOL and spirituality were extracted from the published articles and synthesized for the meta analysis.

Meta-Analysis

Correlation coefficients (r) and number of study participants (n) were extracted from all included articles. Standard error (SE) was calculated using the formula $SE = (1-r^2) / (n-2)$. Correlation coefficients and SE were entered into statistical management program Stata version 16. Cumulative effect sizes and confidence intervals were calculated using a random-effects model. A random-effects model was used due to the heterogeneity between the studies included in this analysis [19]. When reporting cumulative effect sizes, the following guidelines were used: small ≥ 0.20 , medium ≥ 0.50 , large ≥ 0.80 [20].

Results

Our initial literature search yielded 3,908 potential studies for inclusion, after removal of 801 duplicates. Preliminary review of titles and abstracts resulted in 410 full articles being screened for inclusion. Agreement was obtained on 25 articles and 1 abstract for inclusion in this review and meta-analysis. Two of the studies that met inclusion criteria were the results of the dataset [21, 22]. For this review, both articles were included in the systematic review, however only one data set was included in the meta-analysis. Complete agreement was obtained between the two reviewers; there was no third reviewer needed.

Systematic Review

Included articles ranged in publication year from 2005 to 2023, with 17 (68%) published in the 5 years previous to this review [21–36]. Study sample size ranged from 30 participants [24, 37] to 1,578 [38] participants with a total of 8,052 in all 24 included studies. Studies were conducted in 16 countries: one each in Australia [39], Iceland [24], Japan [27], Jordan [23], Lebanon [26], China [29], Cyprus [40], Indonesia [36], Netherlands [30], Poland [33], South Korea [32], and Malaysia [34]. Two countries each had two studies completed: Brazil [41, 42] and Turkey [28, 31]. Eight studies were conducted in the United States [21, 22, 25, 35, 37, 43–45], with two studies done exclusively with a Native American population using the same data set [21, 22]. The mean ages of study participants ranged from 47.9 years [23] to 66.0 years [32] of age. Five studies were completed in an exclusively female breast cancer population [23, 34, 36, 37, 41], one study was done exclusively with female study participants, however the specific cancer types were not specified [21]. Chen et al. (2021) included an exclusive female population diagnosed with gynecological cancers. The remaining 19 studies were completed in mixed gender populations [24–28, 30–33, 35, 39, 40, 43–46]. No studies reported a gender other than male and female. Ten included articles reported the religious makeup of their sample [23, 25, 30, 31, 34, 35, 37, 39, 43, 45]. Of those, three included an exclusive or almost exclusive Muslim population [23, 31, 34]. The remaining seven articles included a dominant Christian population, reporting specific breakdown of Christian

sects [25, 30, 35, 37, 39, 43, 45]. Bai et al. (2015), Daugherty et al. (2005) and Whitford et al. (2008) reported a small percentage of study participants who identified as Jewish, 7.7%, 3%, and 0.2% respectively. No religions were reported outside of Muslim, Christian, and Jewish. All studies were completed with an outpatient cancer population. See Table 1 for a further breakdown of participant cancer type, gender, and religions of included articles.

Table 1
Summary of full-text articles included in this systematic review

First author (pub. year) Country [reference]	Sample Size	Cancer Types	Study Design	Gender	Religion	Spirituality Assessment Tool	QOL Assessment Tool	Correlation (p-value)
Al-Natour (2017) Jordan [23]	150	Breast 100%	Cross-sectional	Female 100%	Muslim 88.5% Christian 11.5%	FACIT-SP	FACT-G	0.67 (<0.001)
Asgeidottir (2017) Iceland [24]	30	Lung 16.7% Breast 10% Gyn 10% Prostate 10% Colorectal 6.7% Head and Neck 6.7% Other 40%	Cross-sectional	Male 26.7% Female 73.3%	Not reported	EORTC QLQ-SWB	EORTC QLQ-C30	0.386 (0.035)
Bai (2018) United States [25]	102	Myeloma 22.5% Breast 17.6% Lung 16.7% Colo/Rectal/Prostate 14.7% Pancreatic 7.8% Other 20.5%	Secondary Analysis	Male 38.2% Female 61.8%	Baptist 41.2% Christian 23.5% Church of God in Christ 6.9% Catholic 4.9% Methodist 4.9% Jehovah's Witness 3.9% Muslim 2.9% None 2% Lutheran 1%	FACIT-SP	FACT-G	0.80 (<0.01)
Bai (2016) United States [45]	52	% not disclosed Head and neck GI Lung Gyn	Secondary Analysis	Male 53.8% Female 46.3%	None 21.2% Protestant 19.2% Catholic 50% Jewish 7.7% Other 1.9%	FACIT-SP	FACT-G	0.74 (<0.001)
Brandao (2021) Brazil [41]	108	Breast 100%	Cross-sectional	Female 100%	Not Reported	WHOQOL-SRPB	EORTC QLQ-C30	0.372 (<0.001)
Chaar (2018) Lebanon [26]	115	Not Reported	Cross-sectional	Male 33% Female 67%	Not Reported	FACIT-SP	EORTC QLQ-C30	0.271 (0.007)

Chen (2021) China [29]	705	Ovarian 45.7% Cervical 29.4% Endometrial 13.3% Trophoblastic 5.4%	Cross-sectional	Female 100%	Not Reported	EORTC QLQ-SWB	EORTC QLQ-C30	0.468 (<0.01)
Damen (2021) Netherlands [30]	400	Not Reported	Secondary Analysis	Male 52% Female 48%	Protestant or Catholic not church going 41% Protestant or Catholic church going 19% Other 40%	FACIT-SP	FACT-G	0.43 (<0.001)
Daugherty (2005) United States [43]	162	GI 49% Lung 34% GYN/Urinary 20% Head and Neck 2% Other 18%	Cross-sectional	Male 55% Female 45%	Catholic 53% Protestant 35% Jewish 3% Other 2% None 8%	FACIT-SP	FACT-G	0.36 (0.001)
Del Giglio (2006) Brazil [46]	72	Not Reported	Cross-sectional	Male 36.1% Female 63.9%	Not Reported	FACIT-SP	FACT-G	Not Reported (0.025)
Frost (2013) United States [44]	1578	Lung 100%	Secondary Analysis	Male 52.1% Female 47.9%	Not Reported	FACIT-SP	SF-8	0.52 (not reported)
Harbali (2022) Turkey [31]	406	Leukemia 27.8% Lymphoma 20.4% Lung 19.2% Breast 8.4% Colon 4.9% Pancreas 4.2% Other 15.1%	Cross-sectional	Male 56.9% Female 43.1%	Muslim 100%	Spiritual Orientation Scale	FACT-G	0.193 (<0.01)
Hsieh (2020) and Lee Y (2023) United States (Native American) [21, 22]	73	Not Reported	Cross-sectional	Female 100%	Not Reported	FACIT-SP	FACT-G	0.58 (<0.01)
Kamijo (2018) Japan [27]	176	Breast 38.6% Gyn 25.0% Pancreatic/liver/bile 15.3%	Cross-sectional	Male 25% Female 75%	Not Reported	FACIT-SP	FACT-G	0.7146 (<0.001)

		Colorectal 9.7%						
		Gastric 3.4%						
		Lung 2.8%						
		Urological 0.6%						
		Thyroid 0.6%						
		Other 4.0%						
Kyranou (2021) Cyprus [40]	104	Not Reported	Cross-Sectional	Male 43% Female 57%	Not Reported	EORTC QLQ-SWB	EORTC QLQ-C30	0.15 (Not Reported)
Leak (2008) United States [37]	30	Breast 100%	Cross-sectional	Female 100%	Baptist 50% Pentecostal 6.7% Presbyterian 3.3% Muslin 3.3% Methodist 6.7% AME Zion 3.3% No affiliation 3.3% Other 23.3%	Spiritual Perspective Scale	Quality of Life Index	0.70 (<0.05)
Lee, M (2021) South Korea [32]	132	Non-Small Cell Lung 100%	Cross-Sectional	Male 72% Female 28%	Not Reported	FACIT-SP	EORTC QLQ-C30	0.39 (<0.0001)
Majda (2022) Poland [33]	101	Not Reported	Cross-Sectional	Male 45% Female 55%	Not Reported	Daily Spiritual Experience Scale	EORTC QLQ-C30	0.516 (<0.001)
Pahlevan Sharif (2021) Malaysia [34]	145	Breast 100%	Cross-Sectional	Female 100%	Muslin	Beliefs and Values Scale	McGill	0.46 (<0.05)
Puspita (2023) Indonesia [36]	112	Breast 100%	Cross-Sectional	Female 100%	Not Reported	FACIT-SP	SF-36	0.817 (<0.001)
Randazzo (2021) United States [35]	606	Breast 100%	Cross-Sectional	Female 100%	Christian 73.9% Unknown 13.7% None 6.3%	FACIT-SP	FACT-G	0.66 (<0.0001)
Whitford (2008) Australia [39]	449	Head/Neck 10.7% Urological 17.8% Breast 26.3%	Secondary analysis	Male 51.9% Female 48.1%	Christian 57.2% Jewish 0.2%	FACIT-SP	FACT-G	0.59 (<0.001)

		Colorectal 10.5%			Unknown 15.9%			
		Lung 13.1%			None 17.2%			
		Lymphoma 13.1%						
		Gyn 2.9%						
		Sarcoma 1.1%						
		Upper GI 4.0%						
		CNS 0.7%						
		Melanoma 4.5%						
		Leukemia 0.7%						
		Unknown 2.7%						
		Other 2.2%						
Yilmaz (2020)	150	GI 69.3%	Cross-sectional	Male 38.7%	Not Reported	FACIT-SP	FACT-G	0.619
Turkey [28]		Breast/Thyroid 30.7%		Female 61.3%				(0.001)

Spiritual Well-Being

To assess spiritual well-being, the Functional Assessment in Chronic Illness Therapy – Spirituality Well-being (FACIT-SP) was used in the majority (68%) of included studies [21–23, 25–28, 30, 32, 35, 36, 39, 43–46]. For studies that used the FACIT-SP, summary spiritual well-being scores ranged from 25.7 (SD 10.0) [32] to 79.3 (SD 18.46) [44]. The FACIT-SP general spiritual well-being scale scores range from 0 to 92, with 92 signifying higher levels of spiritual well-being. Three of the included articles that used the FACIT-SP for their measurement of spirituality did not report their overall mean spirituality score for their study population, however these studies were included based on their inclusion of a correlation coefficient for the relationship between spirituality and QOL [35, 39, 46].

Three of the included studies used the European Organization for Research and Treatment of Cancer Spirituality Scale (EORTC-SP) [24, 29, 40]. For the included studies that used the EORTC-SP, mean spirituality was 60.4 (SD 28.7) [40] and 72.48 (SD 34.99) [29]. An overall mean for spiritual well-being was not provided for one study, however the items means ranged from 2.63 (SD 0.61) to 3.33 (0.99) on a Likert-type scale from 1 (not at all) to 4 (very much) [24]. The EORTC-SP measures spirituality on a scale from 0 to 100, with 100 signifying a higher level of spirituality. One study used the Spirituality Perspective Scale [37]. The Spirituality Perspective Scale measures general spiritual well-being on a scale of 0 to 6, with 6 being high spiritual well-being. In this study the general spiritual well-being mean was 5.65 (SD 0.55) [37]. The Beliefs and Values Scale, a 10-item questionnaire, was also used once [34], by Pahelvan Sharif (2021) as their measurement of spirituality. The mean spirituality of their sample was not reported. The Daily Spiritual Experience Scale, was used once [33]. It is a 15 question measure utilizing a modified, six-point Likert-type scale [47]. Cumulative scores range from 16 to 96, with higher number corresponding to higher spirituality [47]. Using the Daily Spiritual Experience Scale, Majda (2022) reported a mean spirituality of 65.22 (SD 21.05). Brandao (2021) used the World Health Organization Quality of Life Spirituality, Religiousness and Personal Beliefs Scale (WHOQOL-SRPB) with a mean spirituality score of 17.76 (SD 1.84) [41]. The WHOQOL-SRPB includes 32 Likert-style questions with a score between 0 and 20 with higher numbers signifying higher levels of spirituality [41]. The Spiritual Orientation Scale is a 7-item Likert-type scale with a range from 0 to 108, with higher values corresponding to higher levels of spirituality [31]. Harbali (2022) found the mean spirituality of their sample using the Spiritual Orientation Scale to be 87.9 (SD 18.5). See Table 2 for complete breakdown of measurements of spirituality.

Table 2
Measurements of Spirituality included in Review

Measure	# of items	Subscales	Validated Languages	Validated Disease Population	Validated Religious Populations	Reliability from original factor analysis
EORTC-SP	32	Relationship with others, Relationship with self, Relationship with something greater, Existential, Relationship with God if applicable	Bengali, Chinese, Croatian, Dutch, English, Finnish, French, German, Greek, Icelandic, Italian, Japanese, Norwegian, Persian, Portuguese, Russian, Spanish, Slovak, Swahili, Swedish, and Vietnamese [67]	Cancer [68]	Abrahamic Religions [68]	0.7 [68]
FACIT-SP	23	Meaning, Peace, and Faith along with general measurement of spirituality	Arabic, Bengali, Burmese, Chinese, Croatian, Czech, Danish, Dutch, English, Farsi, French, German, Greek, Hebrew, Hindi, Hungarian, Indonesian, Italian, Japanese, Korean, Lithuanian, Malay, Malayalam, Marathi, Nepali, Norwegian, Polish, Portuguese, Serbian, Sinhalese, Spanish, Slovak, Slovene, Swahili, Swedish, Tamil, Telugu, Thai, Turkish, and Vietnamese [69]	Cancer, HIV/AIDS [70] Diabetes, Heart disease, Thyroid disease, Rheumatoid arthritis, COPD [71] Cystic fibrosis [72] Orthopedic disease [73] Psychiatric disorders [74]	Judo-Christian [75, 76] Buddhism [73] Islam [77]	0.88 [70]
Spirituality Perspective Scale	10	N/A	Arabic [78], Chinese [79], English, Italian [80], Korean [81], Persian [82], and Spanish [83]	Terminally ill [84] Chronic Kidney disease [85] Pregnancy [86]	Abrahamic Religions [84]	0.89 [84]
Beliefs and Values Scale	10	N/A	Arabic [87] and English	Cancer	Abrahamic Religions, Hinduism, and Buddhism	0.94 [88]
Daily Spiritual Experience	16	N/A	Arabic, Czech, Danish, Dutch, English, Flemish, Filipino, French, Greek, Hebrew, Hungarian, Italian, Japanese, Korean, Latvian, Lithuanian, Malay, Malayalam, Nepalese, Persian, Polish, Romanian, Russian, Serbian, Slovenian, Thai, Turkish, Ukrainian, Urdu, and Vietnamese [89]	Not specified	Judo-Christian [90]	0.9 [90]
WHOQOL	32	N/A	Arabic, Chinese, Croatian, Czech, Danish, Dari, Dutch, English, French, German, Hindi, Hungarian, Italian, Japanese, Kiswahili, Korean, Lithuanian, Norwegian, Polish, Portuguese, Russian, Serbian, Sinhala, Spanish, Swedish, and Turkish [91]	Not specified	Not specified	0.85 [92]

Measure	# of items	Subscales	Validated Languages	Validated Disease Population	Validated Religious Populations	Reliability from original factor analysis
Spiritual Orientation Scale	7	N/A	Turkish [31]	Unknown	Unknown	0.87 [31]

Quality of Life

The Functional Assessment of Cancer Treatment – General (FACT-G) was the most commonly used measurement of overall QOL (n = 11, 48%) [21, 23, 25, 27, 28, 31, 35, 39, 43, 45, 46]. The European Organization for Research and Treatment of Cancer Comprehensive Quality of Life (EORTC – QOL- C30) was used in eight studies (32%) [24, 26, 29, 30, 32, 33, 40, 41]. The EORTC-QOL-C30 summary of QOL score ranges from 0 to 100 with 100 signifying a higher QOL. In this review, EORTC-QOL-C30 study summary QOL score ranged from 45.2 (SD 24.0) [40] to 78.86 (SD 18.56) [41]. The Short Form 8 (SF-8) [44] and Short Form 36 (SF-36) were each used in a single study. The SF-8 and SF-36 both have a range from 0 to 100, with 100 signifying higher QOL. For the article included in this review, the mean QOL score on the SF-8 was 80 [44], the QOL mean for the SF-36 [36] was not reported in study results. One study each used the McGill Scale [34], and Quality of Life Index [37]. For the Quality of Life Index, a range of 0 to 30 with 30 signifying higher quality of life, was used in a single study with a mean QOL of 26.6 (SD 2.92) [37].

The FACT-G is a commonly used QOL measurement tool designed specifically for use in the cancer population [48]. It includes 27 Likert-style questions and has subscales of physical, social, emotional, and function well-being. It is an international measure having been validated and translated into 74 languages [49]. Original psychometric testing of the FACT-G had good internal reliability [50]. The EORTC-QLQ-C30 was the second most commonly used measurement tool for QOL in the articles included in this review. The EORTC-QLQ-C30 is another well-established, reliable and valid QOL measure specifically designed for the cancer population [48]. The EORTC-QLQ-C30 has been translated and validated in 117 international languages. In addition to a general subscale of global health/QOL, the EORT-QLQ-C30 includes five functional subscales of physical, role, emotional, cognitive, and social. This QOL measurement tool also includes nine symptom subscales of fatigue, nausea and vomiting, pain, dyspnea, insomnia, appetite loss, constipation, diarrhea, and financial difficulties [51]. The SF 8 is a shorten form of the SF 36, both of these measure are highly established measurements of QOL in varying setting of disease and health. Similar to the two QOL measure previously discussed, the SF 8 and SF 36 are international measures that have been validated in over 50 languages in over 25 countries. Both the SF 8 and SF 36 have eight subscales including physical functioning, social functioning, role limitations physical, general medical health, mental health, role limitations emotional, vitality, and bodily pain address the psychological domain, and only 15% (n = 11) address the social domain (remaining 10% (n = 7) address global QOL) [52]. Although less commonly used than the previously discussed measurement tools of QOL, the McGill scale and the Quality of Life Index are both well-established tools to measure QOL. The McGill scale was designed to examine QOL in adults facing a life-limiting illness, specifically adults with cancer or HIV/AIDS. The McGill scale is a 14 item questionnaire with four subscales including physical functioning, existential, social, and psychological [53]. Internal reliability for the McGill scale is 0.94 [53]. In addition to English, the McGill scale has been validated in Arabic [54], Chinese [55], Italian [56], Korean [57], and Spanish [58]. The Quality of Life Index is a valid QOL measure with an internal reliability of 0.96 [59]. The Quality of Life Index is a five item questionnaire includes four subscales of health and function, psychological/spiritual, social and economic, and family [59].

Spirituality and QOL Subscales

Thirteen of the included articles included correlations associated with the measurement subscales of QOL in addition to reporting the overall correlation between spirituality and QOL [23, 26–31, 33, 38–40, 43, 45]. Seven of these studies examined QOL using the FACT-G [23, 27, 28, 31, 39, 43, 45]. Five utilized the EORTC-QLQ-C30 as their QOL measurement [26, 29, 30, 33, 40]. Frost et al. (2013) used the SF-8 as their measurement of QOL. Of the 13 articles that included measurement subscales of QOL in their analysis, eight also included subscales of their spirituality measurement in their correlation analysis [26–30, 39, 40, 45]. Of these eight articles, six examined spirituality through the FACIT-SP [26–28, 30, 39, 45] and two through the EORTC-QLQ-SWB [29, 40].

Meta-Analysis

Correlation of Spiritual Well-Being and Quality of Life

Correlations (r) between QOL and spirituality ranged from 0.817 [36] to 0.15 [40] in the included studies. One study was an abstract only and did not report the correlation, however the p -value was given as 0.025 [46]. All correlations were positive and statistically significant with a p -values of less than 0.05. These positive correlations signify that with higher spirituality, QOL was also higher. It is important to note that these results do not signify a causal relationship due to the limitations of correlations. Kyronou et al. (2021), Harbali et al. (2022), Chaar et al. (2018), Daugherty et al. (2005), Brandao et al. (2021), Asgeirdottir et al. (2017) and Lee et al. (2021) all found a definite, but small, positive correlations based on r 's of 0.15, 0.193, 0.271, 0.36, 0.372, 0.386 and 0.39 respectively [60]. Eleven included articles had a moderate correlation with a substantial relationship with r 's between 0.43 and 0.67 [21, 23, 28–30, 33–35, 39, 44, 60]. The remaining articles included in this review, Leak et al. (2008), Kamijo et al. (2018), Bai et al. (2015 and 2018), and Puspita et al. (2023) had high correlations between spirituality and QOL with values of 0.7, 0.715, 0.74, 0.80, and 0.817 respectfully [60]. The cumulative effect size demonstrated a moderate, substantial relationship between spirituality and QOL in cancer survivors (CES = 0.527; CI 0.463, 0.591; $p < 0.001$) (Fig. 2) [60].

Correlation of Spiritual Well-Being and Quality of Life Subscales

QOL Subscales

The measurement domains of QOL included a combination of those of the FACT-G and the EORTC-QOL-C30, namely: physical health, social health, functional health, and emotional health. Frost (2013) did not include the domains of function or emotional health in their analysis. A small but definite relationship was found between physical health and spirituality (CES = 0.242; CI 0.191, 0.293; $p < 0.001$) (Fig. 3) along with social health and spirituality (CES = 0.323; CI 0.259, 0.388; $p < 0.001$) (Fig. 4). A substantial relationship was found between functional health and spirituality (CES = 0.444; CI 0.306, 0.582; $p < 0.001$) (Fig. 5) along with emotional health and spirituality (CES = 0.437; CI 0.389, 0.486; $p < 0.001$) (Fig. 6).

Spirituality Subscales

For this meta-analysis, only the spirituality subscales of the FACIT-SP are reported here due to the EORTC-QLQ-SWB being used in only two articles. As previously mentioned, the FACIT-SP includes three subscales: meaning, peace, and faith. A substantial relationship was found between meaning and overall QOL (CES = 0.599; CI 0.557, 0.642; $p < 0.001$) and peace and overall QOL (CES = 0.614; CI 0.572, 0.656; $p < 0.001$). Faith and overall QOL were found to have a small, but significant relationship (CES = 0.279; CI 0.228, 0.329; $p < 0.001$). Substantial relationships were also found between meaning and emotional well-being (CES = 0.414; CI 0.365, 0.463; $p < 0.001$) along with peace and emotional well-being (CES = 0.485; CI 0.438, 0.532; $p < 0.001$). See Table 3 for the cumulative effect sizes for the subscales of spirituality and QOL.

Table 3
Cumulative effect sizes and confidence intervals for spirituality and QOL subscales

	Physical Well-Being	Emotional Well-Being	Social Well-Being
Meaning	0.314 (0.263, 0.365)	0.414 (0.365, 0.463)	0.365 (0.315, 0.414)
Peace	0.320 (0.269, 0.371)	0.485 (0.438, 0.532)	0.374 (0.325, 0.424)
Faith	0.151 (0.099, 0.204)	0.219 (0.167, 0.271)	0.176 (0.124, 0.229)
Note: all results had a $p < 0.001$			

Discussion

This systematic review and meta-analysis found evidence of a significant, positive correlation between spirituality and QOL in cancer survivors. All of the included studies found a positive correlation between spirituality and QOL to be statistically significant, and a significant, moderate relationship based on the cumulative effect size. The results of this review indicate that it may be possible to improve the QOL of cancer survivors by improving their spirituality. A similar systematic review examining the relationship between spirituality and QOL in cardiovascular disease found slightly different results than those of cancer survivors, with approximately half of the studies included in the review of cardiovascular disease reporting negative or null correlations between spirituality and QOL in adults with cardiovascular disease [17]. Previous cancer research has found that despite significant advances in cancer diagnosis and treatment, the very diagnosis of cancer continues to result in “existential plight” or a specific search for meaning following the diagnosis of cancer [61]. The difference in these two reviews may be due to a diagnosis of cancer resulting in an influx of thoughts concerning one’s own

potential for existence or nonexistence that is not seen in other, similar life limiting, medical diagnoses such as cardiovascular disease [61, 62]. The phenomena of “existential plight” may aid in explaining the difference between these two reviews and aid in better understanding the relationship between spirituality and QOL in cancer survivorship.

Our findings suggest a positive correlation between increased levels of spirituality and QOL among cancer survivors. Future research is needed to improve the understanding of this relationship and its mediators so that supportive oncologic interventions can be modified to address unmet needs and spiritual suffering. Previous research has shown that increased spirituality is a significant coping mechanism that provides protection against depression [63]. Although not addressed in this review, it is possible that this effect may be stronger in cancer survivor facing a high mortality cancer due to the increased potential for death from the disease resulting in increased introspection and life evaluation [61]. More research is needed to examine the relationship between spirituality and QOL based on disease severity and/or stage of disease.

The positive and statistically significant correlation between the domains of QOL and spirituality further demonstrates the positive relationship between these two variables. It is important to note that all of the relationships between the measurement domains and spirituality were weaker than the relationship between overall QOL and spirituality. These results may help us better understand the intricacies of the relationship between QOL of spirituality. Results demonstrated that the weakest relationship was between physical health and spirituality while the strongest relationship was between emotional health and spirituality. Although more research is needed, this may provide insight into using and intervening on spirituality in order to impact and improve QOL, especially when taking into consideration the potential protective effects of spirituality on depression discussed previously.

Currently, the cancer survivor literature lacks a standard measurement tool(s) for the evaluation of spirituality in cancer survivorship. One reason for this may be the variability of spirituality measurement tools and lack of a concise definition of spirituality in the current literature. Although spirituality measurement tools have been translated and had those translations validated in a wide variety of languages, the original factor analysis and measurement designs were done in limited populations. Only a single measurement of spirituality contained an international population in their study development with the WHOQOL-SRPB including study participants from every inhabited continent in their measurement design and factor analysis validation studies. However, the WHOQOL combines the concepts of spirituality, religious and person beliefs in their measurement scale. With spirituality and religiosity being two separate, yet related concepts this combination may be a barrier separating the concepts of spirituality and religiosity in cancer survivor research. Of the spirituality measurement tools in the review, those that reported religious affiliation of study participants for the primary validation studies, religious affiliation was almost exclusively that of Abrahamic religions (Christianity, Islam, and Judaism). There is a need for a spirituality measure tool that crosses all national borders and religious affiliations in order to truly understand and examine spirituality in the cancer survivorship population. As previously discussed, better understanding spirituality may be a key component in order to truly understand and examine QOL in cancer survivors.

The results of this meta-analysis suggest that meaning and peace are the strongest aspects of spirituality that positively impact QOL, however a limitation to this finding is the subscales of spirituality study measurements. As previously mentioned, the core concept of spirituality are transcendence, meaningfulness and purposefulness, faithfulness, harmonious interconnectedness, holistic being, and integrative energy. Of the seven measurement tools of spirituality, only two included scoring for subscales (FACIT-SP and EORTC-QLQ-SWB). The subscales of the EORTC-QLQ-SWB focused on the relationship aspect of spirituality with relationship to self, others, and something greater than oneself as the key subscales. However, these subscales do not capture key concepts of spirituality such as meaningfulness and purposefulness. However, though the FACIT-SP subscales include meaning and peace, it does not examine the relationship aspect of spirituality found in the EORTC-QLQ-SWB. More research is needed into the subscale of spirituality in order to more completely understand their relationship to QOL. Additional research may also be needed into instrument development around spirituality in order to more accurately measure the concepts of spirituality in cancer survivorship.

Clinical Implications

Despite the demonstrated relationship between spirituality and QOL, cancer survivors have reported that their healthcare providers discuss spirituality and spiritual well-being infrequently with them [64]. A study of providers and adults with advanced illnesses found that providers frequently ‘miss the moment’ to address spirituality and spiritual well-being with patients due to feeling that spiritual care is not something that the health care provider, could provide [65]. Additionally, an international qualitative study found that a key research priority for adults with life-limiting diseases was spirituality and provider education regarding addressing patient spirituality [66]. It is clear that spirituality plays a key and important role in cancer survivors QOL, yet the results of this review demonstrate the need to better understand the role that spirituality has in QOL including the different multidimensional concepts of spirituality.

Limitations

This is the first systematic review to examine the relationship between spirituality and QOL in cancer survivors. However, there are several limitations of this review. We excluded non-English articles, potentially leading to publication bias. Another limitation is the heterogeneity of the types of cancers included in the reviewed studies. QOL and survivability in cancer can vary extensively between cancer types, even within the same cancer type due to stage of disease. Due to that, we were unable to determine if there is a relationship between cancer types and the correlation between spirituality and QOL, further studies are needed to examine these relationships further. Lastly, though there is strong evidence of a correlation between spirituality and QOL in cancer survivorship, our results do not address potential moderators or mediators to the relationship impacting spirituality and QOL. Again, more research is needed to address and examine potential moderators and mediators that potentially impact the relationship between spirituality and QOL.

Conclusion

In conclusion, the results of this review demonstrate the association between spirituality and QOL. Further research is needed in order to have a more complete and in-depth understanding of this relationship and the impact on this relationship for cancer survivors. By addressing spirituality, we, as healthcare providers may move towards supporting cancer survivors to experience and live at the highest level of QOL possible.

Declarations

This work was supported by the Innovation Grant from the School of Nursing at Oregon Health & Science University.

None of the authors have any conflict of interest to report or disclose.

The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by all authors. The first draft of the manuscript was written by Jenny Firkins and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

The dataset generated as part of this review and meta-analysis are available from the corresponding author on reasonable request.

Author Contribution

All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by all authors. The first draft of the manuscript was written by Jenny Firkins and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

References

1. Siegel, R.L., et al., *Cancer statistics, 2023*. CA Cancer J Clin, 2023. 73(1): p. 17–48.
2. Sung, H., et al., *Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries*. CA Cancer J Clin, 2021. 71(3): p. 209–249.
3. Brown, A.J., et al., *Nothing left to chance? The impact of locus of control on physical and mental quality of life in terminal cancer patients*. Supportive Care in Cancer, 2017. 25(6): p. 1985–1991.
4. Lee, Y.J., et al., *Quality of life discordance between terminal cancer patients and family caregivers: a multicenter study*. Supportive Care in Cancer, 2016. 24(7): p. 2853–60.
5. Shrestha, A., et al., *Quality of life versus length of life considerations in cancer patients: A systematic literature review*. Psychooncology, 2019.
6. Khan, F.A., S.S. Akhtar, and M.K. Sheikh, *Cancer treatment - objectives and quality of life issues*. Malayssian Journal Medical Sciences, 2005. 12(1): p. 3–5.
7. Peplau, H.E., *Quality of life: an interpersonal perspective*. Nurse Science Quarterly, 1994. 7(1): p. 10–5.

8. World Health Organization. *Measuring quality of life*. 2019; Available from: <https://www.who.int/healthinfo/survey/whoqol-qualityoflife/en/>.
9. Phillips, J.R., *Quality of life research: its increasing importance*. Nurse Science Quarterly, 1995. 8(3): p. 100–1.
10. Ferrell, B.R., *The quality of lives: 1,525 voices of cancer*. Oncology nursing forum, 1996. 23(6): p. 909–916.
11. Sadat Hoseini, A.S., et al., *A Concept analysis of spiritual health*. Journal of Religion and Health, 2019. 58(4): p. 1025–1046.
12. Rohde, G.E., et al., *Associations between sex, age and spiritual well-being scores on the EORTC QLQ-SWB32 for patients receiving palliative care for cancer: A further analysis of data from an international validation study*. European journal of cancer care, 2019. 28(6): p. e13145-e13145.
13. Bai, M., et al., *Exploring the individual patterns of spiritual well-being in people newly diagnosed with advanced cancer: a cluster analysis*. Quality of Life Research, 2016. 25(11): p. 2765–2773.
14. Ando, M., et al., *A pilot study of transformation, attributed meanings to the illness, and spiritual well-being for terminally ill cancer patients*. Palliative & supportive care, 2008. 6(4): p. 335–340.
15. Tobin, R.S., et al., *Spirituality in Patients With Heart Failure*. JACC Heart Fail, 2022. 10(4): p. 217–226.
16. Liberati, A., et al., *The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration*. Clinical Research, 2009. 339: p. b2700.
17. Abu, H.O., et al., *Association of religiosity and spirituality with quality of life in patients with cardiovascular disease: a systematic review*. Quality of life research, 2018. 27(11): p. 2777–2797.
18. Ouzzani, M., et al., *Rayyan-a web and mobile app for systematic reviews*. Systematic Review, 2016. 5(1): p. 210.
19. Dettori, J.R., D.C. Norvell, and J.R. Chapman, *Fixed-Effect vs Random-Effects Models for Meta-Analysis: 3 Points to Consider*. Global Spine J, 2022. 12(7): p. 1624–1626.
20. Cohen, J., *A power primer*. Psychological Bulletin, 1992. 112(1): p. 155–9.
21. Hsieh, Y.-P., S. Roh, and Y.-S. Lee, *Spiritual Well-Being, Social Support, and Depression Among American Indian Women Cancer Survivors: The Mediating Effect of Perceived Quality of Life*. Families in society, 2020. 101(1): p. 83–94.
22. Lee, Y.S., et al., *Determinants of Life Satisfaction and Quality of Life Among American Indian Women Cancer Survivors: The Role of Psychosocial Resources*. J Evid Based Soc Work (2019), 2023. 20(4): p. 536–555.
23. Al-Natour, A., S.M. Al Momani, and A.M.A. Qandil, *The Relationship Between Spirituality and Quality of Life of Jordanian Women Diagnosed with Breast Cancer*. Journal of religion and health, 2017. 56(6): p. 2096–2108.
24. Asgeirsdottir, G.H., et al., *Spiritual well-being and quality of life among Icelanders receiving palliative care: data from Icelandic pilot-testing of a provisional measure of spiritual well-being from the European Organisation for Research and Treatment of Cancer*. European journal of cancer care, 2017. 26(2): p. e12394-n/a.
25. Bai, J., et al., *Spirituality and Quality of Life in Black Patients With Cancer Pain*. Journal of pain and symptom management, 2018. 56(3): p. 390–398.
26. Chaar, E.A., et al., *Evaluating the impact of spirituality on the quality of life, anxiety, and depression among patients with cancer: an observational transversal study*. Supportive Care in Cancer, 2018. 26(8): p. 2581–2590.
27. Kamijo, Y. and T. Miyamura, *Spirituality and associated factors among cancer patients undergoing chemotherapy*. Japan journal of nursing science: JJNS, 2020. 17(1): p. e12276-n/a.
28. Yilmaz, M. and H.Ö. Cengiz, *The relationship between spiritual well-being and quality of life in cancer survivors*. Palliative & Supportive Care, 2020. 18(1): p. 55–62.
29. Chen, J., et al., *Association between spiritual well-being, quality of life, anxiety and depression in patients with gynaecological cancer in China*. Medicine (Baltimore), 2021. 100(1): p. e24264.
30. Damen, A., et al., *Validation of the FACIT-Sp-12 in a Dutch cohort of patients with advanced cancer*. Psychooncology, 2021. 30(11): p. 1930–1938.
31. Harbali, S.M. and Z. Koc, *Psychosocial Problems in Relation to Spiritual Orientation and Religious Coping Among Oncology Muslim Patients*. Cancer Nursing, 2022. 45(2): p. 120–131.
32. Lee, M.K., *Interactions of Spiritual Well-Being, Symptoms, and Quality of Life in Patients Undergoing Treatment for Non-Small Cell Lung Cancer: A Cross-Sectional Study*. Seminars in Oncology Nursing, 2021. 37(2): p. N.PAG-N.PAG.
33. Majda, A., et al., *Influence of Spirituality and Religiosity of Cancer Patients on Their Quality of Life*. Int J Environ Res Public Health, 2022. 19(9).

34. Pahlevan Sharif, S., et al., *Spirituality and quality of life in women with breast cancer: The role of hope and educational attainment*. Palliative & Supportive Care, 2021. 19(1): p. 55–61.
35. Randazzo, D.M., et al., *Spiritual well-being and its association with health-related quality of life in primary brain tumor patients*. Neurooncol Pract, 2021. 8(3): p. 299–309.
36. Dewi, I.P., et al., *Determinants of Spiritual Well-Being That Impact Breast Cancer Patients' Quality of Life*. Journal of Holistic Nursing, 0(0): p. 08980101231181272.
37. Leak, A., J. Hu, and C.R. King, *Symptom Distress, Spirituality, and Quality of Life in African American Breast Cancer Survivors*. Cancer nursing, 2008. 31(1): p. E15-E21.
38. Frost, M.H., et al., *Spiritual well-being and quality of life of women with ovarian cancer and their spouses*. Journal of Supportive Oncology, 2012. 10(2): p. 72–80.
39. Whitford, H.S., I.N. Olver, and M.J. Peterson, *Spirituality as a core domain in the assessment of quality of life in oncology*. Psycho-oncology (Chichester, England), 2008. 17(11): p. 1121–1128.
40. Kyranou, M. and M. Nicolaou, *Associations between the spiritual well-being (EORTC QLQ-SWB32) and quality of life (EORTC QLQ-C30) of patients receiving palliative care for cancer in Cyprus*. BMC Palliative Care, 2021. 20(1): p. 1–11.
41. Brandão, M.L., et al., *Association between spirituality and quality of life of women with breast cancer undergoing radiotherapy*. Rev Esc Enferm USP, 2021. 55: p. e20200476.
42. Delgado-Guay, M.O., et al., *Association between Spirituality, Religiosity, Spiritual Pain, Symptom Distress, and Quality of Life among Latin American Patients with Advanced Cancer: A Multicenter Study*. Journal of Palliative Medicine, 2021. 24(11): p. 1606–1615.
43. Daugherty, C.K., et al., *Trusting God and medicine: Spirituality in advanced cancer patients volunteering for clinical trials of experimental agents*. Psycho-oncology (Chichester, England), 2005. 14(2): p. 135–146.
44. Frost, M.H., et al., *Spiritual well-being in lung cancer survivors*. Supportive Care in Cancer, 2013. 21(7): p. 1939–1946.
45. Bai, M., et al., *Exploring the relationship between spiritual well-being and quality of life among patients newly diagnosed with advanced cancer*. Palliative & supportive care, 2015. 13(4): p. 927–935.
46. Del Giglio, A., et al., *Spirituality correlates positively with higher quality of life and negatively with depression in a sample of low income brazilian cancer patients*. Journal of clinical oncology, 2006. 24(18_suppl): p. 18534–18534.
47. Puchalski, C.M., et al., *Improving the spiritual dimension of whole person care: reaching national and international consensus*. Journal of palliative medicine, 2014. 17(6): p. 642–656.
48. Firkins, J., et al., *Quality of life in "chronic" cancer survivors: a meta-analysis*. Journal of cancer survivorship, 2020. 14(4): p. 504–517.
49. , F.A.o.C.I.T. FACT-G. 2021; Available from: <https://www.facit.org/measures/fact-g>.
50. Cella, D.F., et al., *The Functional Assessment of Cancer Therapy scale: development and validation of the general measure*. Journal of clinical oncology, 1993. 11(3): p. 570–579.
51. , E.O.f.R.a.T.o.C. *Quality of Life of Cancer Patients*. 2024; Available from: <https://qol.eortc.org/questionnaire/eortc-qlq-c30/>.
52. Ware, J.E., et al., *SF-36 health survey manual and interpretation guide*. 1993, Boston, MA: The Health Institute New England Medical Center.
53. Cohen, S.R., et al., *Measuring the quality of life of people at the end of life: The McGill Quality of Life Questionnaire–Revised*. Palliative medicine, 2017. 31(2): p. 120–129.
54. Omar, M.T.A. and A.H. Alnahdi, *Psychometric Properties and Factorial Analysis of the Arabic McGill-QoL Questionnaire in Breast Cancer*. Breast Cancer (Dove Med Press), 2023. 15: p. 813–824.
55. Natarajan, D., et al., *The Validation of the Chinese (Cantonese) Version of the Patient Dignity Inventory in a Hong Kong Palliative Care Setting*. Palliat Med Rep, 2023. 4(1): p. 231–238.
56. Aiello, E.N., et al., *The Italian McGill Quality of Life Questionnaire-Revised (MQoL-R): Psychometrics in Neurological and Neoplastic Populations*. J Palliat Care, 2023. 38(3): p. 295–298.
57. Kang, K.A. and M.N. Lee, *Cross-Cultural Validation of the McGill Quality of Life Questionnaire-Revised (MQOL-R), Korean Version; A Focus on People at the End of Life*. J Hosp Palliat Care, 2022. 25(3): p. 110–120.
58. Velez, J.C., et al., *Evaluating the performance of the Pain Interference Index and the Short Form McGill Pain Questionnaire among Chilean injured working adults*. PLoS One, 2022. 17(5): p. e0268672.

59. Ferrans, C.E. and M.J. Powers, *Psychometric assessment of the quality of life index*. Research in nursing & health, 1992. 15(1): p. 29–38.
60. Guilford, J.P., *Fundamental statistics in psychology and education*. 3rd ed. 1956, New York: McGraw-Hill.
61. Lee, V., *The existential plight of cancer: meaning making as a concrete approach to the intangible search for meaning*. Support Care Cancer, 2008. 16(7): p. 779–85.
62. Weisman, A.D. and J.W. Worden, *The existential plight in cancer: significance of the first 100 days*. Int J Psychiatry Med, 1976. 7(1): p. 1–15.
63. Gonzalez, P., et al., *Spiritual well-being and depressive symptoms among cancer survivors*. Support Care Cancer, 2014. 22(9): p. 2393–400.
64. Peteet, J.R. and M.J. Balboni, *Spirituality and religion in oncology*. CA: A Cancer Journal for Clinicians, 2013. 63(4): p. 280–289.
65. Selby, D., et al., *Patient versus health care provider perspectives on spirituality and spiritual care: the potential to miss the moment*. Annals of Palliative Medicine, 2017. 6(2): p. 143–152.
66. Selman, L.E., et al., *Patients' and caregivers' needs, experiences, preferences and research priorities in spiritual care: A focus group study across nine countries*. Palliative Medicine, 2018. 32(1): p. 216–230.
67. , E.O.f.R.a.T.o.C. *Spiritual Well-Being*. 2024; Available from: <https://qol.eortc.org/questionnaire/qlq-swb32/>.
68. Vivat, B., et al., *The international phase 4 validation study of the EORTC QLQ-SWB32: A stand-alone measure of spiritual well-being for people receiving palliative care for cancer*. European journal of cancer care, 2017. 26(6): p. e12697-n/a.
69. , F.A.o.C.I.T. *FACIT-Sp*. 2021; Available from: <https://www.facit.org/measures/facit-sp>.
70. Peterman, A.H., et al., *Measuring spiritual well-being in people with cancer: the functional assessment of chronic illness therapy–Spiritual Well-being Scale (FACIT-Sp)*. Annals of behavioral medicine, 2002. 24(1): p. 49–58.
71. Machul, M., et al., *Psychometric Properties of the Polish Version of the FACIT-Sp-12: Assessing Spiritual Well-Being Among Patients with Chronic Diseases*. Med Sci Monit, 2023. 29: p. e941769.
72. Alvarenga, W.A., et al., *Evidence of validity of internal structure of the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being Scale (FACIT-Sp-12) in Brazilian adolescents with chronic health conditions*. Front Psychol, 2022. 13: p. 991771.
73. Weng, N., et al., *Evaluation of the reliability and validity of Functional Assessment Of Chronic Illness Therapy–Spiritual Well-Being–Expanded in elderly patients with chronic orthopaedic diseases*. Psychogeriatrics, 2021. 21(1): p. 32–41.
74. Lucchetti, G., et al., *Validation of the Portuguese version of the Functional Assessment of Chronic Illness Therapy–Spiritual Well-Being scale (FACIT-Sp 12) among Brazilian psychiatric inpatients*. J Relig Health, 2015. 54(1): p. 112–21.
75. Canada, A.L., et al., *Assessing the impact of religious resources and struggle on well-being: a report from the American Cancer Society's Study of Cancer Survivors-I*. J Cancer Surviv, 2022.
76. Murphy, P.E., et al., *An examination of the 3-factor model and structural invariance across racial/ethnic groups for the FACIT-Sp: a report from the American Cancer Society's Study of Cancer Survivors-II (SCS-II)*. Psycho-oncology (Chichester, England), 2010. 19(3): p. 264–272.
77. Jafari, N., et al., *Translation and validation of the Persian version of the functional assessment of chronic illness therapy–Spiritual well-being scale (FACIT-Sp) among Muslim Iranians in treatment for cancer*. Palliat Support Care, 2013. 11(1): p. 29–35.
78. Musa, A.S., et al., *Translation and Validation of the Arabic Version of the Spiritual Perspective Scale*. Res Theory Nurs Pract, 2023.
79. Chen, F., et al., *Psychometric Evaluation of the Spiritual Perspective Scale in Palliative Care Nurses in China*. J Relig Health, 2022. 61(4): p. 2804–2818.
80. Parozzi, M., et al., *Validation of the Italian version of the spirituality and spiritual care rating scale (SSCRS-ita)*. Int J Nurs Knowl, 2023. 34(2): p. 126–132.
81. Kim, S.S., et al., *Translation and psychometric testing of the Korean Versions of the Spiritual Perspective Scale and the Self-transcendence Scale in Korean elders*. J Korean Acad Nurs, 2012. 42(7): p. 974–83.
82. Rohani, C., et al., *Health index, sense of coherence scale, brief religious coping scale and spiritual perspective scale: psychometric properties*. J Adv Nurs, 2010. 66(12): p. 2796–806.
83. Jorquera-Cox, M., *Validation of the Spanish Version of P. Reed's Spiritual Perspective Scale in Older People in Chile*. Horizonte de Enfermería, 2023. 34(3): p. 465–476.
84. Reed, P.G., *Spirituality and well-being in terminally ill hospitalized adults*. Research in Nursing & Health, 1987. 10(5): p. 335–344.

85. Davison, S.N. and G.S. Jhangri, *Existential and religious dimensions of spirituality and their relationship with health-related quality of life in chronic kidney disease*. Clin J Am Soc Nephrol, 2010. 5(11): p. 1969–76.
86. Dailey, D.E. and A.L. Stewart, *Psychometric characteristics of the spiritual perspective scale in pregnant African-American women*. Res Nurs Health, 2007. 30(1): p. 61–71.
87. Fawares, F., et al., *Spiritual Beliefs of Jordanian Adult Patients Receiving Palliative Care*. Journal of religion and health, 2021. 60(4): p. 2849–2861.
88. King, M., et al., *Measuring spiritual belief: development and standardization of a Beliefs and Values Scale*. Psychological medicine, 2006. 36(3): p. 417–425.
89. Underwood, L.G. *Daily Spiritual Experience Scale*. 2024; Available from: <https://www.dsescal.org/translations/>.
90. Underwood, L.G. and J.A. Teresi, *The daily spiritual experience scale: development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data*. Annals of behavioral medicine, 2002. 24(1): p. 22–33.
91. , W.H.O. *WHOQOL: Measuring Quality of Lift*. 2024; Available from: <https://www.who.int/tools/whoqol/whoqol-100>.
92. Group, T.W., *The World Health Organization quality of life assessment (WHOQOL): Development and general psychometric properties*. Social science & medicine (1982), 1998. 46(12): p. 1569–1585.
93. Statements & Declarations
94. This work was supported by the Innovation Grant from the School of Nursing at Oregon Health & Science University.
95. None of the authors have any conflict of interest to report or disclose.
96. The views expressed in this article are those of the authors and do not necessarily reflect the position or policy of the Department of Veterans Affairs or the United States government.
97. All authors contributed to the study conception and design. Material preparation, data collection, and analysis were performed by all authors. The first draft of the manuscript was written by Jenny Firkins and all authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.
98. The dataset generated as part of this review and meta-analysis are available from the corresponding author on reasonable request.

Figures

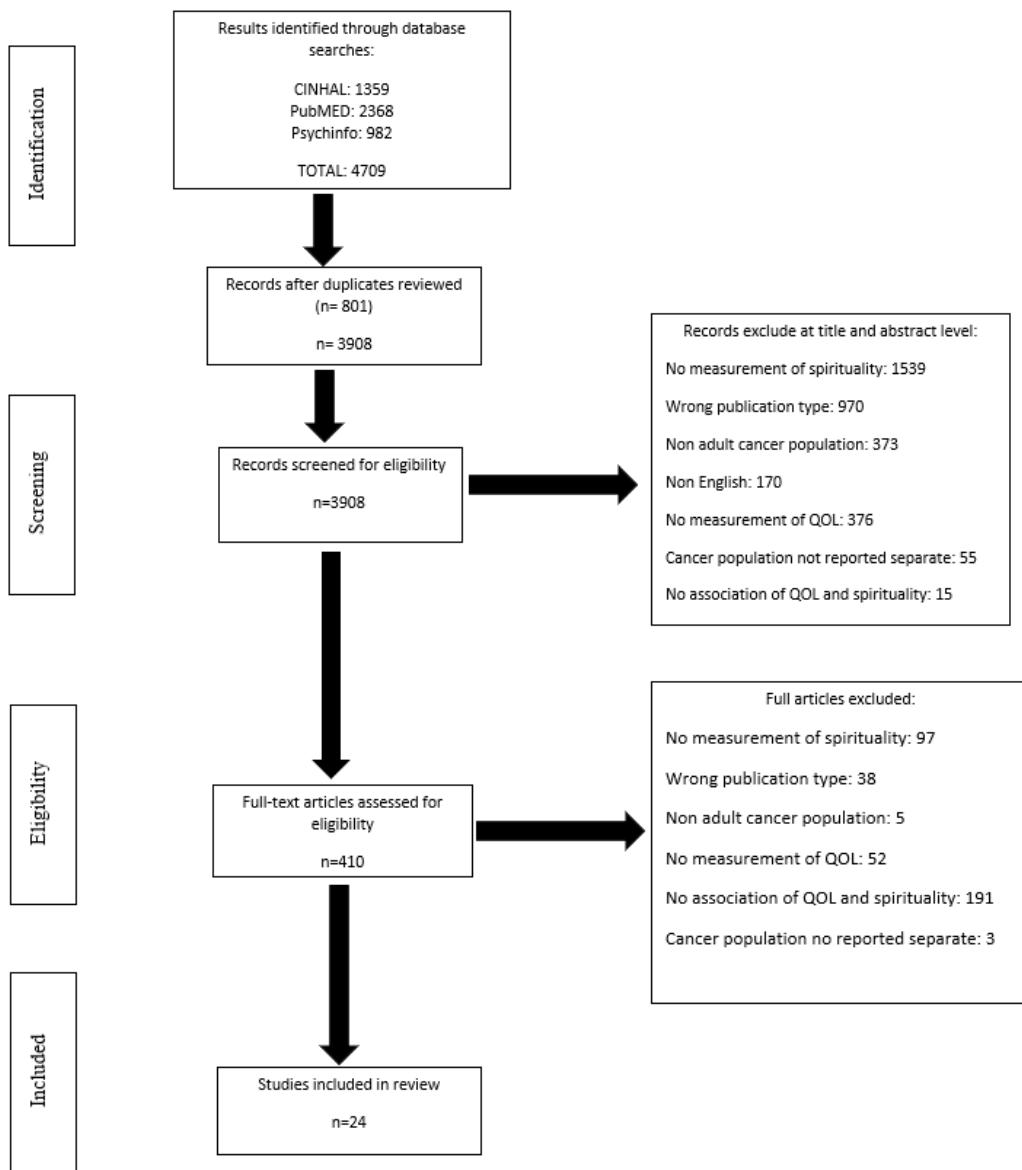


Figure 1

Flow diagram for systematic review methodology in accordance with PRISM guidelines

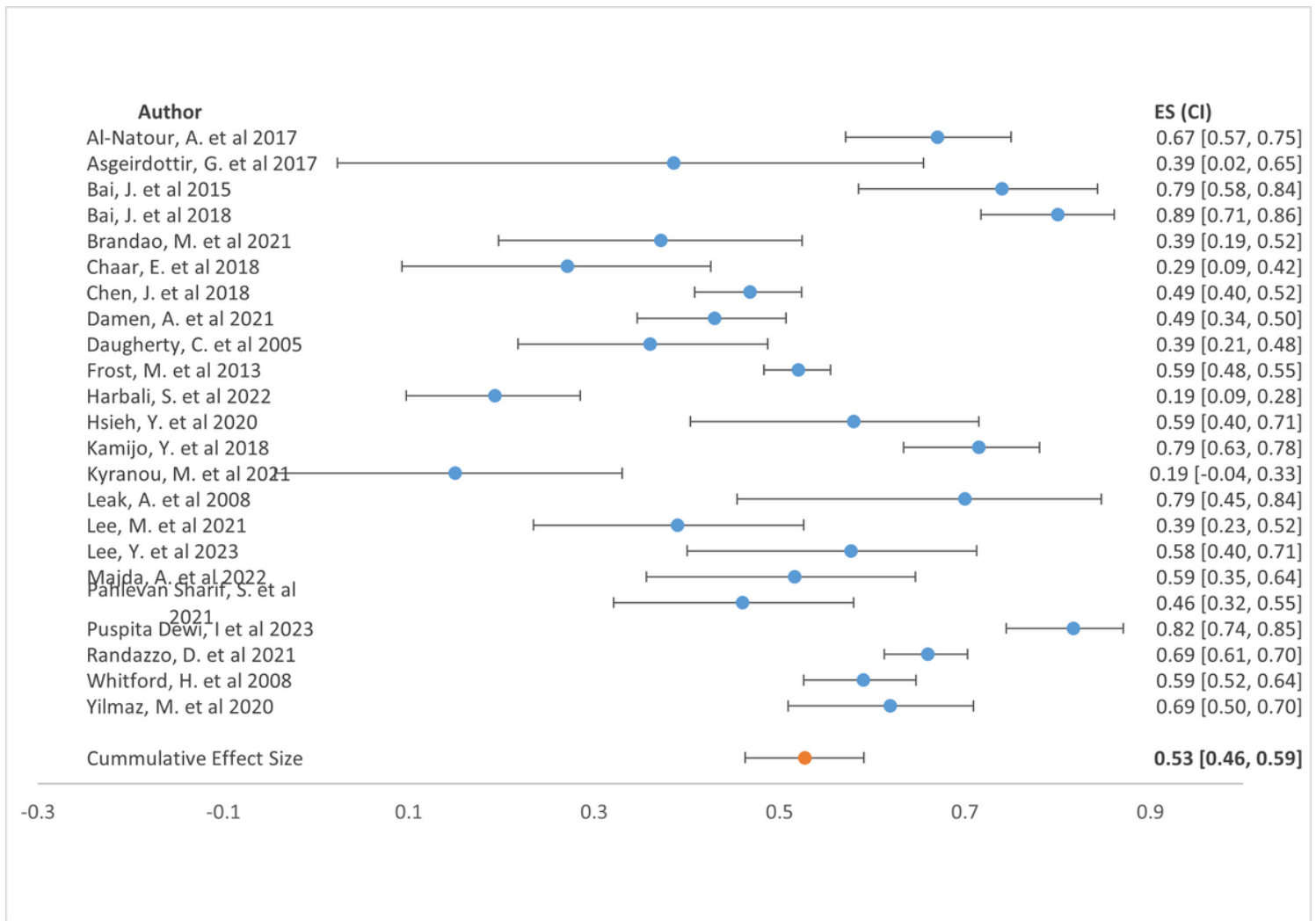


Figure 2

Forrest plot of cumulative effect size of correlation between QOL and spirituality

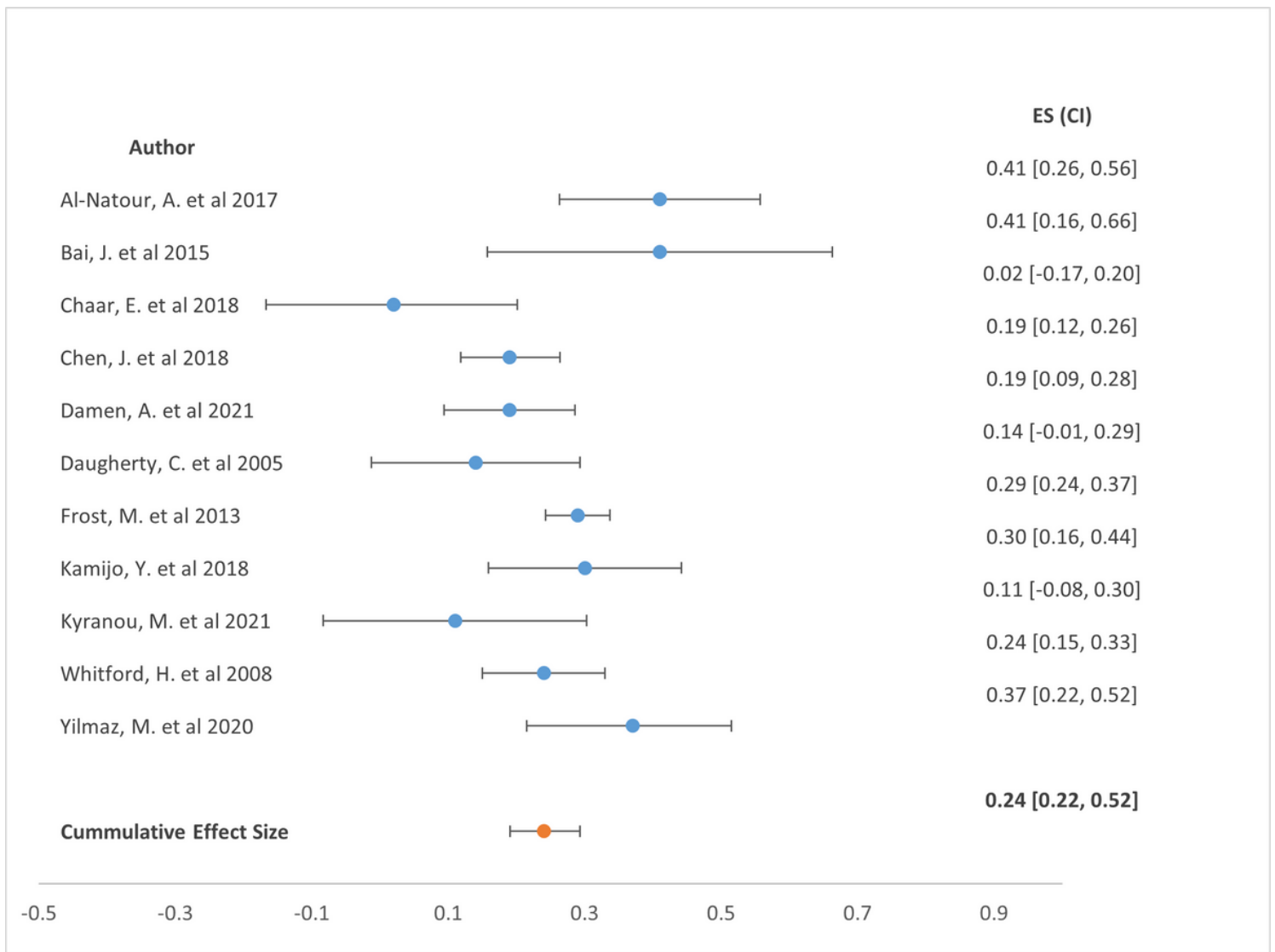


Figure 3

Forrest plot of cumulative effect size of correlation between physical health and spirituality

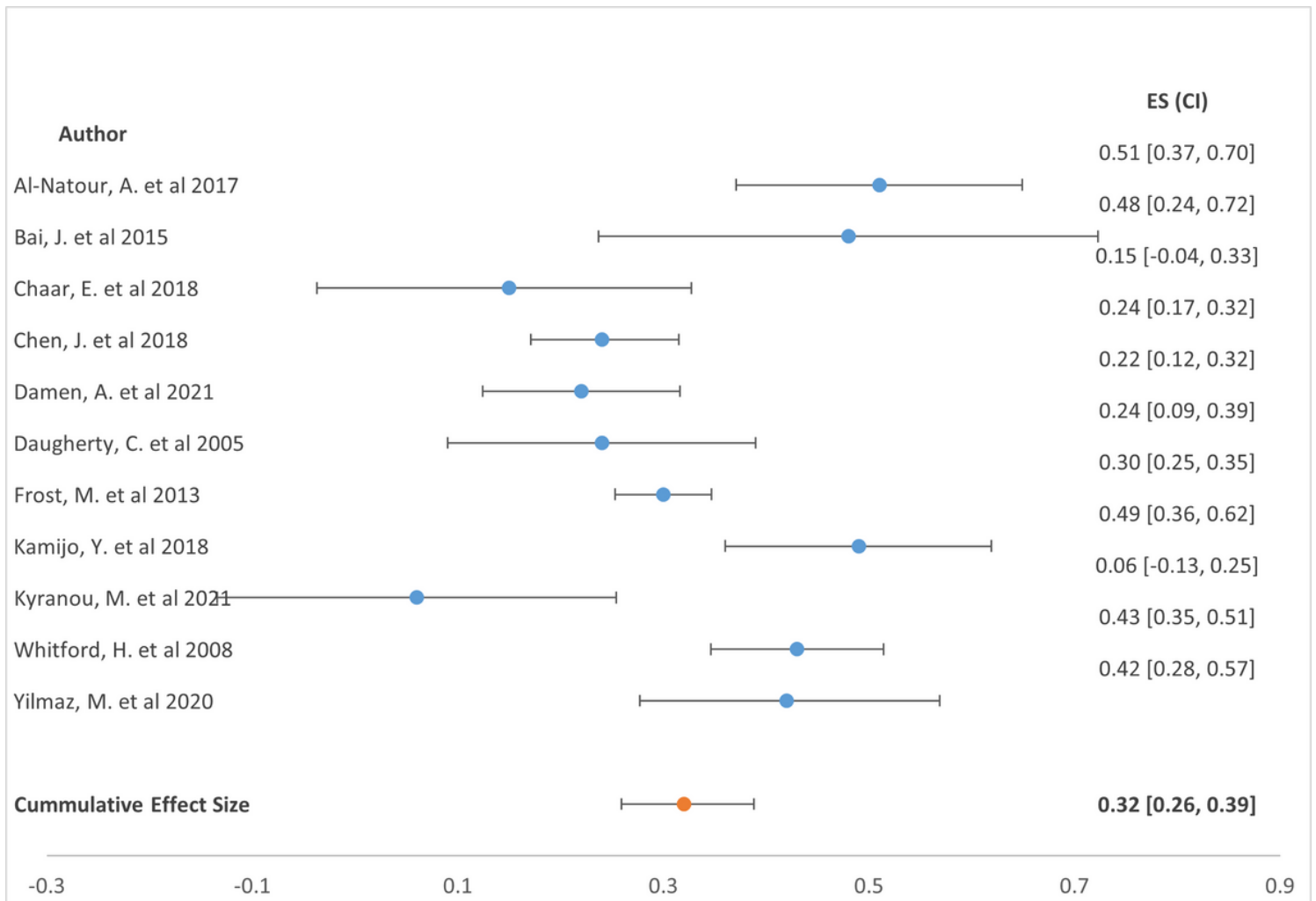


Figure 4

Forrest plot of cumulative effect size of correlation between social health and spirituality

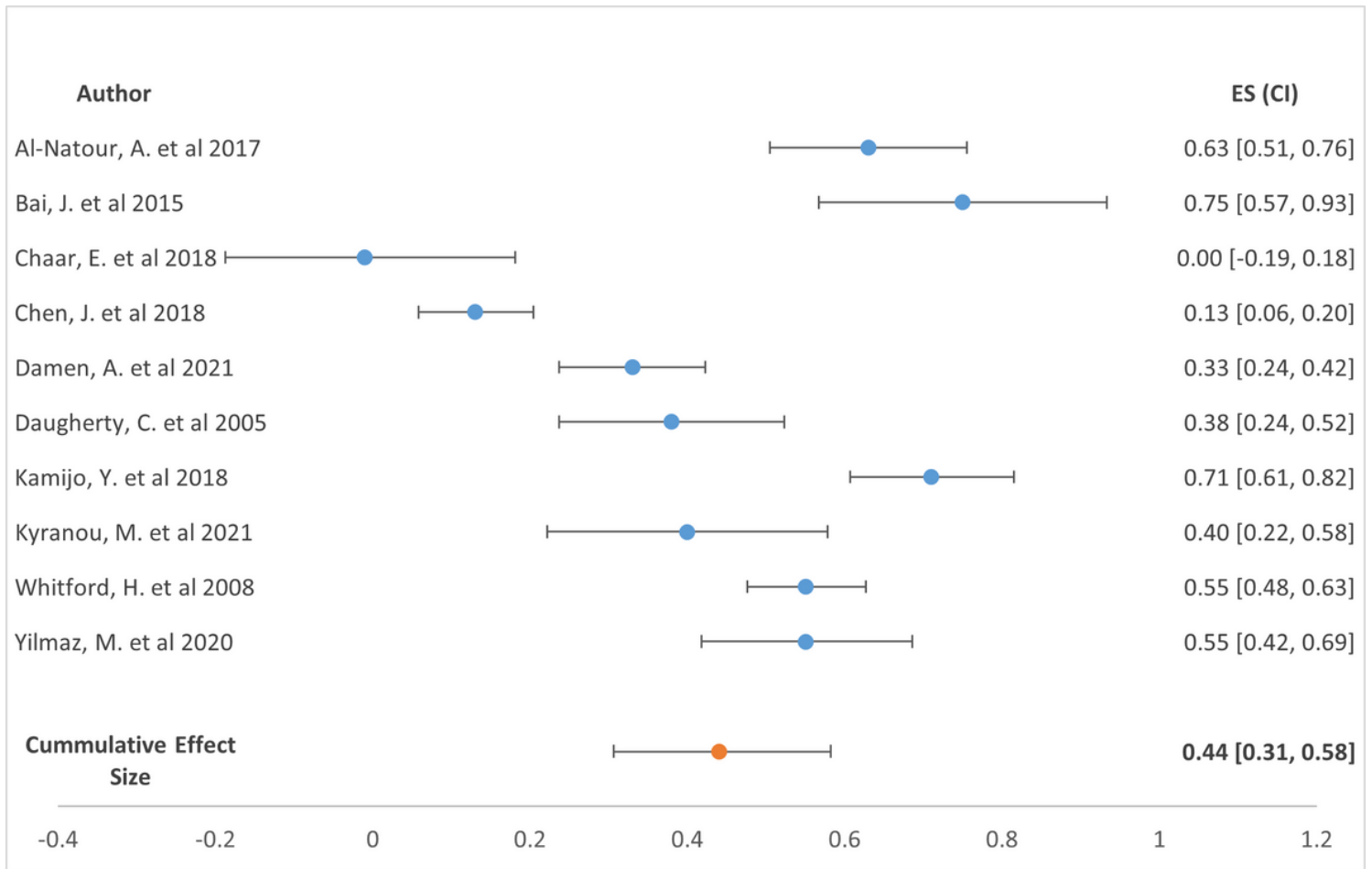


Figure 5

Forrest plot of cumulative effect size of correlation between functional health and spirituality

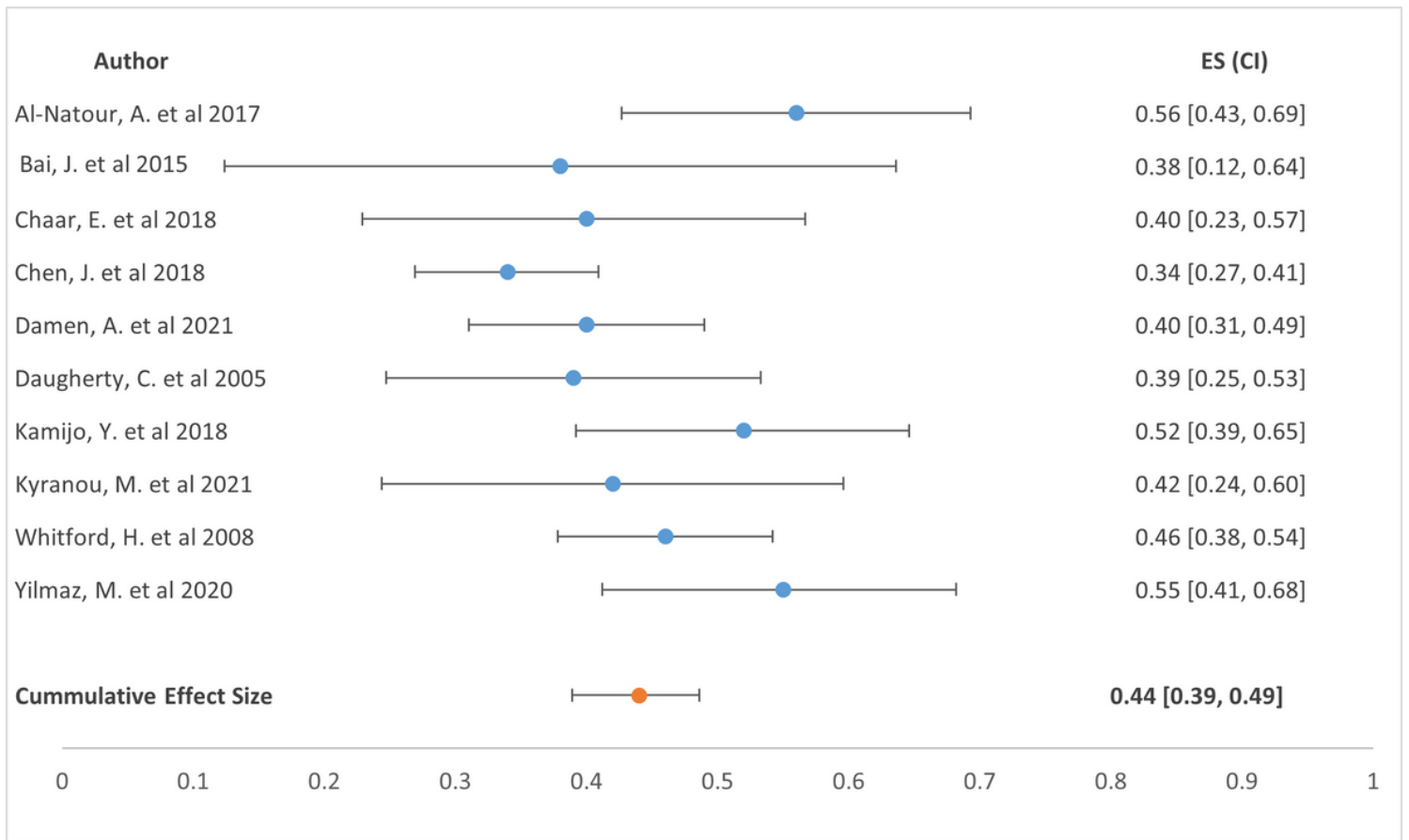


Figure 6

Forrest plot of cumulative effect size of correlation between emotional health and spirituality

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Appendix.docx](#)