Spiritual coping, psychosocial adjustment, and physical health in youth with chronic illness: a meta-analytic review

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ABSTRACT

Objective: The current systematic review and meta-analysis aimed to assess the strength of the relationships between religious/spiritual coping strategies and psychosocial adjustment and physical health in youth with chronic illness. Background: Faced with medical stressors and uncertainty about their illness, spiritual beliefs and behaviours are important for youth with chronic illness. Research suggests that some spiritual coping strategies are helpful (positive), while others are not (negative), and these dimensions of spiritual coping are important predictors of functioning among youth with chronic illness. Method: Fourteen studies, published between 1990 and 2015, met inclusion criteria for the meta-analysis and were analysed using both a fixed effects model and random effects model (REM). Results: Findings revealed significant, small to moderate associations between negative spiritual coping and more concurrent internalising problems (REM \( r = .34 \)), lower quality of life (REM \( r = -.34 \)), and poorer health (REM \( r = -.08 \)). Under the fixed, but not REM, the combined effects showed small to moderate significant relationships between positive spiritual coping and fewer internalising problems (\( r = -.19 \)) and better physical health (\( r = .19 \)). Conclusion: The results reveal that spiritual coping is an important coping strategy for paediatric patients. Consistent with findings among adults with chronic illness, negative spiritual coping puts paediatric patients at risk for psychosocial maladjustment and poorer health. Intervention research is needed to determine if targeting spiritual coping improves health and psychosocial well-being.

With advances in early disease detection and treatment, survival rates among youth with chronic illness continue to rise (van der Lee, Mokkink, Grootenhuis, Heymans, & Offringa, 2007). Recognising that the adverse effects of chronic illness extend well beyond the domains of physical functioning, impact psychosocial adjustment and persist into adulthood (Curtis & Luby, 2008; Pinquart & Shen, 2011), research on coping and adjustment with paediatric illness has received considerable attention. Consistent with research in other populations (e.g., Graven & Grant, 2013; Guardino & Schetter, 2014), coping plays an important role in promoting adjustment to paediatric chronic illness (Compas, Jaser, Dunn, & Rodriguez, 2012). Among different types of coping strategies, a growing body of research has focused on the role of religious or spiritual coping.

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Supplemental material for this article can be accessed here: http://dx.doi.org/10.1080/17437199.2016.1159142.

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Although there is some disagreement and inconsistency in the definitions of religiosity and spirituality, religiosity is typically conceptualised as a formal and institutional expression of the sacred (e.g., attending religious services, praying), whereas spirituality is viewed as the internal and personal expression of the sacred (e.g., spiritual peace or connectedness with a higher power) (Hill & Pargament, 2008). However, there is substantial overlap between religiosity and spirituality, particularly in childhood and adolescence when non-religious spirituality is quite rare (Smith, 2003). Because of this overlap and the personal nature of religious beliefs and coping, we use the umbrella terms of spiritual beliefs or coping. Specifically, spiritual coping involves the use of spiritual beliefs (i.e., beliefs related to the sacred, such as believing that God has a plan for you) or behaviours (e.g., praying to God) to problem-solve or manage stressful life circumstances, such as having a chronic illness (Koenig, Pargament, & Niels, 1998).

Spiritual beliefs are particularly important for youth with chronic illness, who frequently face medical stressors and uncertainty about their illness. Spiritual beliefs can help youth positively reframe or make meaning out of their illness, alleviate worry or fear about the future, and provide alternative means of support when family or friends are not available (e.g., during hospitalisations) (Cole, Benore, & Pargament, 2004). Indeed, patients with different types of chronic illness endorse using spiritual beliefs to cope with their illness. Youth with sickle cell disease, for instance, indicate that spiritual beliefs help them feel control over their illness or find meaning in the experience (Cotton, Grossoehme, & McGrady, 2012). Similarly, paediatric patients with cystic fibrosis describe turning to God for support in managing their illness (Pendleton, Cavalli, Pargament, & Nasr, 2002).

Not all spiritual coping strategies, however, are helpful. Initial research among hospitalised adults demonstrated that beliefs reflecting spiritual struggle or punishment (e.g., questioning God’s existence or one’s faith, believing one’s illness is a punishment for sins) were related to higher levels of depression and poorer quality of life (Pargament, Smith, Koenig, & Perez, 1998). Spiritual coping, therefore, was conceptualised as being two-dimensional, with ‘positive spiritual coping’ involving the use of faith for comfort or strength to deal with difficult circumstances and ‘negative spiritual coping’ reflecting spiritual discontentment, doubt, or feelings of abandonment or punishment by God (Pargament et al., 1998). Among adults, meta-analytic review supports this duality of spiritual coping, revealing that positive and negative spiritual coping strategies are related to better and worse psychosocial adjustment, respectively (Ano & Vasconcelles, 2005).

Consistent with research in adults, positive and negative spiritual coping are also important predictors of emotional and behavioural functioning among youth with chronic illness. Cross-sectional and prospective research alike indicate that positive spiritual coping is linked with lower emotional distress and better quality of life in multiple paediatric illness groups (Luberto, Yi, Tsevat, Leonard, & Cotton, 2012; Lyon et al., 2014; Reynolds, Mrug, & Guion, 2013; Reynolds, Mrug, Hensler, Guion, & Madan-Swain, 2014; Shelton, Linfield, Carter, & Morton, 2005), while negative spiritual coping has been linked with more internalising and externalising problems, and worse quality of life (Benore, Pargament, & Pendleton, 2008; Reynolds et al., 2013). Spiritual coping remains a significant predictor of psychosocial adjustment, even after controlling for secular coping, disease severity, and other covariates (Benore et al., 2008) and is linked more strongly to emotional health in youth with chronic illness compared to their healthy counterparts (Cotton, Kudel, et al., 2009).

Research has also emerged that supports the role of spiritual coping in physical health outcomes among both adult and paediatric patients. Among youth with cystic fibrosis, one study linked negative spiritual coping with worse retrospective pulmonary function decline (Grossoehme, Szczesniak, McPhail, & Seid, 2013), while another linked positive spiritual coping with prospective slower decline in pulmonary functioning and nutritional status and fewer days hospitalised over a five-year period (Reynolds, Mrug, Britton, et al., 2014). These findings are consistent with studies among adults with chronic illness, which have linked positive spiritual coping with better health outcomes, such as improved cardiac functioning over time (Ai, Peterson, Bolling, & Rodgers, 2006), and negative spiritual coping with worse physical health, including higher mortality rates (Pargament, Koenig, Tarakeshwar, & Hahn, 2001), even after controlling for baseline physical and mental health.
Despite these promising findings, results have varied across studies with paediatric populations. One study, for instance, found significant associations between positive spiritual coping and more anxiety and poorer quality of life (Benore et al., 2008), while others have not evidenced significant associations between spiritual coping and psychosocial or health outcomes (Cotton, Grossoehme, et al., 2009; Landolt, Vollrath, & Ribi, 2002). Given the mixed results and growth of research in this area, a quantitative synthesis of research on spiritual coping and health among youth with chronic illness is warranted.

Most research on spiritual coping and mental and physical health has been conducted with adults, and existing reviews typically exclude paediatric studies or do not explicitly compare youth with adults (Ano & Vasconcelles, 2005; Hackney & Sanders, 2003; McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000; Smith, McCullough, & Poll, 2003). Given substantial developmental differences in cognitive and emotional functioning of children, adolescents, and adults, patterns of results obtained in studies with adults may not necessarily translate to paediatric populations. In particular, adolescence has been described as a sensitive period for the development of spirituality (Good & Willoughby, 2008), and spirituality was more strongly related to depression among adolescents than in emerging adults (Yonker, Schnabelrauch, & DeHaan, 2012). Moreover, the few systematic reviews and a meta-analysis that have addressed links between religion/spirituality and adolescents’ psychological and health outcomes have not included studies of youth with chronic illness (Cotton, Zebracki, Rosenthal, Tsevat, & Drotar, 2006; Rew & Wong, 2006; Yonker et al., 2012), despite these youth being more likely to utilise and benefit from spiritual coping (Cotton, Kudel, et al., 2009; Smith et al., 2003). Thus, spiritual coping may play a unique role in psychological and health functioning of paediatric populations with chronic illness, but no qualitative or quantitative summaries of this literature exist to date.

Thus, the purpose of the present meta-analysis is to empirically synthesise existing research on the roles of positive and negative spiritual coping in psychosocial adjustment and physical functioning among youth with chronic illness. Outcomes of psychosocial adjustment will include internalising problems and quality of life, as these have been the focal outcomes of most research in this area. Regarding physical health, both objective (e.g., glucose levels) and subjective measures of physical functioning (e.g., physician-rated functional status) will be examined. Reflecting the current conceptualisation of spiritual coping, positive and negative spiritual coping will be examined separately. We hypothesise that higher levels of positive spiritual coping and lower levels of negative spiritual coping will be associated with fewer internalising problems, higher quality of life, and better physical functioning among paediatric patients.

Method

Selection of studies

Eligible articles were identified through searching each of the following databases: PubMed, Web of Knowledge, Academic Search Premier, PsycINFO, and ProQuest (Dissertations and Theses). The following search terms were used: (religious coping OR spiritual OR religious) AND (paediatric OR youth OR child OR adolescent) AND (chronic illness OR serious illness OR medical illness), and paediatric chronic illness AND (religious coping OR spiritual) AND (adjustment OR health). In addition, researchers who have published two or more studies on religious and spiritual coping in paediatric populations were contacted for copies of articles that focused on spiritual coping and adjustment and the reference lists of relevant empirical papers were hand searched. The search included articles published in or before December 2015 and originating from any geographic region. The abstracts identified through the search procedures were examined to identify studies that met inclusion criteria.

To be included in the meta-analysis, a study must have been (a) conducted with youth (average age between 6 and 18 years) with a medical illness; (b) measured spiritual coping; (c) assessed
emotional or physical health; and (d) provided a quantitative index of association between spiritual coping and outcomes. Only studies published in full, in English, and providing the statistics necessary for calculating an effect size were included in the meta-analysis. Unpublished studies (e.g., dissertations) were also included.

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow diagram was used to detail study selection (Figure 1). The initial search resulted in 479 records. After removing duplicates, the abstracts of 290 manuscripts were screened. Screening identified 42 studies appearing to meet inclusion criteria. After review of these studies, 16 met inclusion criteria. In order to avoid statistical dependence between studies, two were excluded. One was a dissertation that had since been published using more extensive results (Benore, 2004; Benore et al., 2008) and the other was a cross-sectional report that was later followed by a longitudinal examination of the same sample (Reynolds et al., 2013; Reynolds, Mrug, Hensler, et al., 2014). Although the longitudinal results were reported among the primary results, we also examined the cross-sectional findings in supplemental analyses, because they were more comparable to the majority of other studies which were cross-sectional. Thus, 14 studies (plus the additional cross-sectional report by Reynolds et al., 2013) were included in the meta-analysis.

Data extraction

Two of the authors coded the primary studies. Data to compute effect sizes were extracted, as well as the following: (a) characteristics of studies (published and unpublished); (b) participant demographics (age, gender, ethnicity, and chronic illness); (c) participants’ religious affiliations; (d) measures of spiritual coping; (e) measures of emotional or physical health; and (f) source of information (child or caregiver). To assess reliability, 50% of the studies were independently coded by both authors. Inter-rater agreement across the coded variables was very good (98%). Discrepancies between coders were resolved through review of the original manuscript and discussion.
Operational definitions

Spiritual coping was defined as the use of spiritual beliefs – either positive or negative – as a coping strategy. Pargament’s research served as the operational framework for classifying spiritual coping (see Pargament, Feuille, & Burdzy, 2011). Specifically, positive spiritual coping was defined as thoughts or beliefs related to seeking spiritual connectedness, comfort, and strength with God during difficult circumstances. The use of prayer and measures of spiritual well-being were included in this definition. Negative spiritual coping included reports of spiritual struggle and conflict with God, such as questioning God’s power or viewing difficult circumstances in terms of spiritual punishment or abandonment. Measures assessing utilisation or frequency of positive and negative spiritual coping were included in the meta-analysis.

Psychosocial adjustment included empirically validated self-reported measures of internalising problems (i.e., anxiety, depression, and emotional distress) and quality of life. Physical functioning was defined as any measure of physical health or physical status for a specific disease (e.g., spirometrics and body mass index). Functional status and adherence were included in this definition. Study characteristics are provided in Table 1.

Analysis of effect sizes

Effect sizes were scored in the form of bivariate correlations (r). When correlational data were unavailable, statistics such as means, SDs, p-values, and odds ratios were used to derive r (Borenstein, Hedges, Higgins, & Rothstein, 2009). Cohen’s (1988) guidelines were utilised to classify the strength of the correlations, with 0.10, 0.30, and 0.50 referring to small, medium/moderate, and large effect sizes, respectively. To ensure the independence of analysed observations, a single estimate was derived from each sample. For instance, in studies reporting on multiple internalising problems (e.g., anxiety and depression), estimates were averaged to yield one effect size per study (Borenstein et al., 2009). Hence, each set of participants only contributed one value to each analysis.

Meta-analytic tests were run using both a random effects model (REM) and a fixed effects model (FEM). REM is generally preferable, because it estimates a distribution of population effect sizes (Hedges & Vevea, 1998) and provides greater generalisability due to the assumption that studies differ in ways that may impact results (Borenstein et al., 2009). However, if the number of studies is small, the estimate of variance between studies under REM will have poor precision, which may yield inaccurate results (Borenstein et al., 2009). Thus, FEM is recommended when analyses rely on only a few studies. FEM estimates a single population effect size and does not allow for inferences about a larger population of potential studies represented by those included in this meta-analysis (i.e., unconditional inferences), but it does provide a common effect size among the identified studies and thus inferences about the specific studies can be drawn (i.e., conditional inferences) (Borenstein et al., 2009; Card, 2012; Hedges & Vevea, 1998). Given the small number of studies available, both models were utilised for all analyses, and significant effects for individual studies will also be reported.

To identify potential heterogeneity in the effect sizes, the Q statistic was computed. A significant Q indicates that the variability observed among the studies’ effect sizes is greater than would be expected from sampling error alone (Borenstein et al., 2009). To capture the amount of variation in effects due to heterogeneity (vs. sampling error), the $I^2$ was calculated (Higgins, Thompson, Deeks, & Altman, 2003). $I^2$ values of 25%, 50%, and 75% are generally considered to be low, moderate, and high, respectively (Higgins et al., 2003). The possibility of publication bias was also examined using Egger’s test (Egger, Smith, Schneider, & Minder, 1997) and Begg and Mazumdar’s (1994) rank correlation test. Both tests examine associations between effect estimates and sample sizes across studies, with lack of bias suggested by a symmetrical funnel shape with greater variability in effect sizes among smaller than larger studies. This symmetry is tested as a zero intercept (in Egger’s test) or zero association (Begg and Mazumdar’s test) between effect size and standard
<table>
<thead>
<tr>
<th>Author (Year)</th>
<th>Sample size</th>
<th>Geographic location</th>
<th>Pediatric population</th>
<th>Age M (SD)</th>
<th>Measure of spiritual coping</th>
<th>Question examples</th>
<th>Scale</th>
<th>Outcome(s)</th>
<th>Measure</th>
<th>Reporter</th>
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</thead>
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<tr>
<td>Benore et al. (2008)</td>
<td>87</td>
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<td>Boeving (2003) Dissertation</td>
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<td>‘I ask God to help.’</td>
<td>‘I never do this’ (0) to ‘I always do this’ (4)</td>
<td>Depression Anxiety Quality of life</td>
<td>CDI MASC PedsQL</td>
<td>Self</td>
</tr>
<tr>
<td>Cotton, Grossoehme, et al. (2009)</td>
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<td>14 (2)</td>
<td>Brief RCOPE</td>
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<td>Quality of life</td>
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<tr>
<td>Cotton, Kudel, et al. (2009)</td>
<td>154</td>
<td>USA (Ohio)</td>
<td>Inflammatory bowel disease</td>
<td>15 (2)</td>
<td>Spiritual Well-Being Scale</td>
<td>‘I believe that a Higher Power loves me and cares about me.’</td>
<td>‘Strongly disagree’ (0) to ‘strongly agree’ (4)</td>
<td>Depression Quality of life</td>
<td>CDI-Short Form PedsQL 4.0-Emotional Functioning scale PedsQL 4.0</td>
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</tr>
<tr>
<td>Landolt et al. (2002)</td>
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<td>Switzerland (German speaking)</td>
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<td>2 items added to the ‘How I Coped Under Pressure Scale’ (HICUPS)</td>
<td>Not reported.</td>
<td>Never (0) to frequently (3)</td>
<td>Functional status (physical activities of daily living)</td>
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<td>Physician</td>
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<tr>
<td>Luberto et al. (2012)</td>
<td>151</td>
<td>USA (Ohio)</td>
<td>Asthma</td>
<td>16 (2)</td>
<td>1-item on prayer in author-developed, self-reported measure on CAM modalities</td>
<td>‘How frequently do you pray to manage your asthma?’</td>
<td>Never (1) to once per day or more (5)</td>
<td>Quality of life</td>
<td>PedsQL 4.0-Psychosocial Functioning scale</td>
<td>Self</td>
</tr>
</tbody>
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<th>Author (Year)</th>
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<th>Outcome(s)</th>
<th>Measure</th>
<th>Reporter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lyon et al. (2014)</td>
<td>38</td>
<td>USA (District of Columbia)</td>
<td>HIV+</td>
<td>17 (2)</td>
<td>Spiritual Well-Being Scale of the Functional Assessment of Chronic Illness Therapy-Version 4 (FACIT-SP-Ex-4)</td>
<td>'I find strength in my faith or spiritual beliefs.'</td>
<td>Not at all’ (0) to ‘very much’ (4)</td>
<td>Depression Anxiety Quality of life</td>
<td>BDI BAI PedsQL 4.0</td>
<td>Self</td>
</tr>
<tr>
<td>Park and Nachman (2010)</td>
<td>18</td>
<td>USA (New York)</td>
<td>HIV+</td>
<td>18 (SD not reported)</td>
<td>Author-developed, self-reported measure of religious beliefs</td>
<td>'God is punishing me with this infection.' 'I believe in miracles.'</td>
<td>'Strongly disagree' (1) 'strongly agree' (5) Average scores ≥ 3.5 = 'high religious believer'</td>
<td>Adherence to highly active antiretroviral therapy (HAART)</td>
<td>NIAID Pediatric AIDS Clinical Trials Pediatric Adherence Questionnaire, Module 1-III Behaviour/ Identification</td>
<td>Self</td>
</tr>
<tr>
<td>Shelton (2004) Dissertation</td>
<td>100</td>
<td>USA (Kentucky)</td>
<td>Asthma Cystic fibrosis</td>
<td>11 (SD not reported)</td>
<td>Children’s Spiritual Coping Measure</td>
<td>'If God and I work together, things will get better.'</td>
<td>3-point Likert scale; descriptors not provided. Higher scores indicate more use of spiritual coping. Never (0) to frequently (3)</td>
<td>Emotional symptoms</td>
<td>BASC-2, Emotional Symptoms Index</td>
<td>Self-reported if ≥12 years old Parent-reported if ≤ 11 years old</td>
</tr>
<tr>
<td>Zehnder, Prchal, Vollrath, and Landolt (2006)</td>
<td>161</td>
<td>Switzerland (German speaking)</td>
<td>Cancer Diabetes Epilepsy Youth who had been in an accident</td>
<td>10 (2)</td>
<td>2 item measure</td>
<td>'Did you ask God for help?' and &quot;did you pray to God for comfort?&quot;</td>
<td>Internalising problems</td>
<td>CBCL – Internalising scale</td>
<td>Parent</td>
<td></td>
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error. All analyses were performed using Comprehensive Meta-Analysis version 2 (Borenstein, Hedges, Higgins, & Rothstein, 2010).

Results

The total number of participants across all 14 studies included in the meta-analysis was 1176. Weighted by the total number of participants in each study, the average age of the participants was 12.8 years, with a range of 7–22 years. Condition or illnesses included were asthma, cystic fibrosis, sickle cell disease, inflammatory bowel disease, diabetes, epilepsy, cancer, HIV, or serious injury. The overall sample included 51% females. Twelve studies recruited participants in the USA (primarily in Midwest and South) and two in German-speaking parts of Switzerland. Across 10 studies reporting demographic information on the race/ethnicity of 784 participants, the overall sample included 42% Caucasians, 43% African-Americans, 1% Hispanic-Americans, and 14% of ‘other’ racial/ethnic backgrounds. Five studies (n = 270) reported on religious affiliation, across which 28% of participants defined themselves as Protestant, 6% as Catholic, 51% as ‘Other Christian’, 1% as Jewish, 5% as Other (e.g., Islam), and 9% as having no religious affiliation (Table 1).

All studies utilised convenience samples that were typically recruited from specialty paediatric clinics or hospitals. Only three studies reported participation rates, which ranged from 75% to 88%; another study reported that 34% of eligible patients were enrolled in the study. The design of seven studies (50%) was cross-sectional, but two of the six longitudinal studies reported relevant statistics only for the cross-sectional associations (Benore et al., 2008; Luberto et al., 2012) and one study did not clearly specify the time points used (Lyon et al., 2014). Thus, only four studies clearly reported on longitudinal associations, spanning a one-year (Zehnder et al., 2006), two-year (Reynolds, Mrug, Hensler, et al., 2014), and five-year (Reynolds, Mrug, Britton, et al., 2014) prospective periods and a three-year retrospective period (Grossoehme et al., 2013).

Spiritual coping was assessed with validated questionnaires in 9 (64%) studies, although one of them dichotomised the measure into any vs. no negative spiritual coping (Grossoehme et al., 2013). Two studies developed or adapted existing questionnaires (with 12 and 24 items, respectively; Park & Nachman, 2010; Shelton, 2004); two used the average of self-developed two items (Landolt et al., 2002; Zehnder et al., 2006); and one study used a single item (Luberto et al., 2012). When reported, internal consistency of these measures was excellent for positive spiritual coping (Cronbach’s α = .84 to .96) and acceptable for negative spiritual coping (α = .71 to .79). Self-reports of psychological adjustment were utilised when multiple reporters were available due to their greater validity (Varni, Limbers, & Burwinkle, 2007). Thus, self-report was used in eight studies, parent report in one study, and either self- or parent-report depending on the child’s age in the last study of psychological adjustment. All adjustment measures were widely used with established psychometric properties, and most had acceptable to good reliability in the studied samples (α = .68 to .94 when reported). Health outcomes were assessed with objective health indicators gathered from medical records (two studies), physician rating (one study), or self-report of adherence (one study).

Associations with positive spiritual coping

Internalising problems

Under the REM, the combined effect size was nonsignificant (r = −.19, p = .09) (Table 2). However, under the fixed effects model, the combined effect showed a small to moderate, significant relationship between positive spiritual coping and fewer internalising problems (r = −.19, p < .001). The Q statistic was 44.06, p < .001, indicating a significant amount of observed variation across the studies, and the I² value of 86.38 indicated a high level of inconsistency in effects across studies. No publication bias was found by Egger’s test (p = .87) or Begg and Mazumdar’s rank correlation test (p = .88). A forest plot of the individual and overall effect sizes, as well as their 95% CI, are
shown in Figure 2. Individual study effect sizes ($r$) for internalising problems ranged from $-0.54$ to $0.15$. Three of the seven studies included in this analysis showed significant, medium to large associations between positive spiritual coping and fewer internalising problems ($r = -0.37$, $p < 0.001$; Reynolds, Mrug, Hensler, et al., 2014; $r = -0.44$, $p < 0.01$; Lyon et al., 2014; $r = -0.54$, $p < 0.001$; Shelton, 2004), while the remaining four effects were nonsignificant (Benore et al., 2008; Boeving, 2003; Cotton, Kudel, et al., 2009; Zehnder et al., 2006). Two of the seven studies used longitudinal designs, and one study (Zehnder et al.) was of poorer quality due to using a self-developed two-item measure of spiritual coping. Using cross-sectional instead of longitudinal results in the one study where both were available (Reynolds et al., 2013; Reynolds, Mrug, Hensler, et al., 2014) did not change the overall pattern of the results.

### Quality of life

Overall, no significant effect between positive spiritual coping and quality of life emerged (REM $r = -0.02$, $p = 0.89$; FEM $r = -0.01$, $p = 0.92$) (Table 2). There was variability and a high degree of inconsistency across study effects ($Q = 23.04$, $p < 0.001$; $I^2 = 78.30$). Neither Egger’s test ($p = 0.98$) nor Begg and Mazumdar’s rank correlation test ($p = 0.85$) indicated publication bias. Individual effect sizes for quality of life ranged from $r = -0.38$ to $0.39$ (Figure 3). Three of the six studies showed significant, small to moderate associations between positive spiritual coping and quality of life but the direction of their effects varied. Lyon et al. (2014) showed a positive relationship between positive spiritual coping and better quality of life ($r = 0.39$, $p < 0.05$) and Luberto et al. (2012) showed a significant prediction of better quality of life from prayer ($\beta = 0.21$, $p = 0.01$), whereas Benore et al. (2008) demonstrated a negative association ($r = -0.38$, $p < 0.001$). The remaining three studies did not reveal significant effects (Boeving, 2003; Cotton, Grossoehme, et al., 2009; Ezop, 2002). One of

### Table 2. Effect sizes examining the effects of positive and negative spiritual coping on internalising problems, quality of life, and physical health.

<table>
<thead>
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<th></th>
<th>REM</th>
<th>FEM</th>
<th>REM</th>
<th>FEM</th>
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<tr>
<td></td>
<td>Cohen’s $r$</td>
<td>95% CI</td>
<td>Cohen’s $r$</td>
<td>95% CI</td>
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<tr>
<td>Positive spiritual coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalising problems</td>
<td>$-0.19^+$</td>
<td>$-0.39$ to $-0.03$</td>
<td>$-0.19^+$</td>
<td>$-0.25$ to $-0.10$</td>
</tr>
<tr>
<td>Quality of life</td>
<td>$-0.02$</td>
<td>$-0.36$ to $-0.08$</td>
<td>$-0.02$</td>
<td>$-0.30$ to $-0.19$</td>
</tr>
<tr>
<td>Physical health</td>
<td>$-0.40^+$</td>
<td>$-0.06$ to $-0.72$</td>
<td>$-0.40^+$</td>
<td>$-0.46$ to $-0.34$</td>
</tr>
<tr>
<td>Negative spiritual coping</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internalising problems</td>
<td>$0.20$</td>
<td>$-0.12$ to $0.48$</td>
<td>$0.17$</td>
<td>$0.04$ to $0.30$</td>
</tr>
<tr>
<td>Quality of life</td>
<td>$-0.34^+$</td>
<td>$-0.58$ to $-0.05$</td>
<td>$-0.39^+$</td>
<td>$-0.51$ to $-0.26$</td>
</tr>
<tr>
<td>Physical health</td>
<td>$-0.08^+$</td>
<td>$-0.15$ to $-0.01$</td>
<td>$-0.08^+$</td>
<td>$-0.15$ to $-0.01$</td>
</tr>
</tbody>
</table>

$p < .10$.

$p < .05$.

$p < .01$.

$p < .001$.

Figure 2. Forest plot of associations between positive spiritual coping and internalising problems.

Note: REM = random effects model. $^+$p < .05. $^*$p < .01. $^{**}$p < .001.
the studies (Luberto et al.) was of poorer quality due to using a single-item measure of spiritual coping.

**Physical health**

Under the REM, the combined effect size was nonsignificant \( r = .40, p = .08 \) (Table 2). However, under the fixed effects model, the combined effect showed a small to moderate, significant relationship between positive spiritual coping and better physical health \( r = .19, p = .003 \). Significant heterogeneity and inconsistency across the effects was observed \( Q = 18.52, p < .001; I^2 = 89.20 \). No consistent evidence of publication bias emerged (Egger’s test \( p = .05 \); Begg and Mazumdar’s rank correlation test, \( p = .12 \)). The individual effect sizes for physical health ranged from .03 to .70 (Figure 4), with two of the three studies demonstrating significant, large associations between positive spiritual coping and better health functioning, specifically adherence to antiretroviral medications (Park & Nachman, 2010, \( r = .70, p < .001 \)) and five-year trajectories of pulmonary function and nutritional status (Reynolds, Mrug, Britton, et al., 2014). The study that did not show a significant effect (Landolt et al., 2002) was of poorer quality, using a two-item measure of spiritual coping and a single-item, three-point physician rating of functional status.

**Associations with negative spiritual coping**

**Internalising problems**

Under the REM, the combined effect size was nonsignificant \( r = .20, p = .23 \) (Table 2). However, under the fixed effects model, the combined effect showed a small to moderate, significant relationship between negative spiritual coping and more internalising problems \( r = .17, p = .013 \). Significant heterogeneity and inconsistency across the effects was observed \( Q = 5.36, p = .02; I^2 = 81.35 \). Due to the small number of studies, publication bias could not be assessed. Interestingly, the cross-sectional association between negative spiritual coping and more internalising problems was significant \( r = .35, p = .001 \); Benore et al., 2008), whereas the longitudinal relationship over a two-year period was not \( r = .04, p = .65 \); Reynolds, Mrug, Hensler, et al., 2014, Figure 5). Supplementary analyses using cross-sectional results from both studies (i.e., using Reynolds et al., 2013) revealed significant
random and fixed effects ($r = .34, p < .001$) and no heterogeneity ($Q = .01, p > .05; I^2 = .00$). The cross-sectional relationship between negative spiritual coping and internalising problems in Reynolds et al. was $r = .34, p < .001$. All of these studies used established measures.

Quality of life
Under both the random and fixed effects models, the combined effect size was significant (REM $r = - .34, p < .05$; FEM $r = - .39, p < .001$) (Table 2), indicating significant, inverse relationships between negative spiritual coping and quality of life. The $Q$ statistic was 7.97 ($p < .05$) and $I^2$ value was 74.91, indicating variability and inconsistency across study effects. No publication bias was found by Egger's test ($p = .11$) or Begg and Mazumdar's rank correlation test ($p = .12$). Individual effect sizes for quality of life ranged from $- .51$ to $.01$ (Figure 6). Two of the three studies showed significant, medium to large associations between negative spiritual coping and worse quality of life ($r = - .51, p < .001$; Benore et al., 2008; $r = - .42, p = .001$; Ezop, 2002). The remaining study did not show a significant effect (Cotton, Grossoehme, et al., 2009). All three studies used cross-sectional design and established measures.

Physical health
Under both the random and fixed effects model, the cumulative effect size was significant (both REM and FEM $r = - .08, p = .037$) (Table 2). No heterogeneity and inconsistency across the effects was observed ($Q = 0.02, p = .884; I^2 = 0.00$). Due to the small number of studies, publication bias could not be assessed. Individual effect sizes for physical health ranged from $- .07$ to $- .10$ (Figure 7). One study showed a significant, but small association between negative spiritual coping and a three-year retrospective trajectory of pulmonary function ($r = - .07, p < .05$; Grossoehme et al., 2013), and the other showed a small and nonsignificant link between negative spiritual coping and prospective, five-year trajectories of pulmonary function and nutritional status (Reynolds, Mrug, Britton, et al., 2014). Both of these studies used objective indicators of health status and established measures of spiritual coping, although Grossoehme et al. dichotomised their measure into any vs. no negative spiritual coping. Additionally, both examined trajectories of health outcomes over several years, either retrospectively or prospectively.
Discussion

This meta-analysis of 14 studies indicated that negative spiritual coping is related to lower quality of life and poorer physical health among youth with chronic or serious medical illness, as well as more concurrent internalising problems. Under the fixed effects model, there were also significant associations between positive spiritual coping and fewer internalising problems and better physical health, but these relationships may not generalise to other studies. Most analyses showed significant heterogeneity and inconsistency among studies, suggesting that spiritual coping may be more strongly related to outcomes under some conditions.

Our results for negative spiritual coping were based on only two or three studies and relatively small combined sample sizes (N = 186 and 215), and thus, they need to be interpreted with caution. Nevertheless, these results are consistent with longitudinal and meta-analytic studies demonstrating poorer adjustment among adults who use negative spiritual coping strategies for managing difficult events (Ano & Vasconcelles, 2005; Pargament, Koenig, Tarakeshwar, & Hahn, 2004). Our effect sizes (r = .34 for internalising problems from cross-sectional data and r = −.34 for quality of life) were larger compared to meta-analytic results with adults (r = .22 and r = .14; Ano & Vasconcelles, 2005; Smith et al., 2003), which may reflect heightened importance of negative spiritual coping in children and adolescents dealing with significant stressors. In the face of a serious or chronic medical illness, particularly during childhood and adolescence, negative spiritual coping may represent a significant disruption in a child’s developing worldview and relationship with God that may contribute to sadness, worry for the future, and a sense of poorer quality of life. Although children and adolescents typically report, on average, low frequency of negative spiritual coping, over 30% of paediatric patients endorse feeling spiritually punished or question God’s love for them on some occasions (Cotton, Grossoehme, et al., 2009; Reynolds, Mrug, Hensler, et al., 2014).

Although the present findings provide evidence for the cross-sectional association between negative spiritual coping and internalising problems, they do not provide support for negative spiritual coping as a predictor of internalising problems over time. Among adults with chronic illness, negative spiritual coping consistently predicts poorer adjustment and health over time (Ai, Seymour, Tice, Kronfol, & Bolling, 2009; Ironson, Stuezele, Fletcher, & Ironson, 2006; Pargament et al., 2001; Trevino et al., 2010). However, fewer longitudinal studies have been conducted with paediatric patients and the findings have been mixed. Among youth with asthma, Benore et al. (2008) found that negative spiritual coping during baseline hospitalisation predicted higher levels of anxiety one month later. However, baseline anxiety levels were not controlled in these analyses, thus not providing strong support for a directional effect. In contrast, among youth with diabetes or cystic fibrosis, baseline negative spiritual coping was unrelated to depression assessed two years later, with or without controlling for baseline depression (Reynolds, Mrug, Hensler, et al., 2014). Instead, higher baseline symptoms of depression predicted more frequent negative spiritual coping at follow-up. These findings suggest that the associations between negative spiritual coping and internalising problems may be bidirectional and perhaps depend on the time lag between the assessments. Clearly, more longitudinal studies that control for baseline levels of adjustment are needed to clarify the directionality of these relationships in paediatric populations.
The biopsychosocial processes through which negative spiritual coping may contribute to internalising problems, lower quality of life, and poorer health are currently not well understood. Among adults, mediating factors, such as optimism and specific cognitions, have been suggested to play a role (Pargament, 2011). Concerns about death, for instance, fully mediated the relationship between spiritual struggle and depression among adults with end-stage congestive heart failure (Edmondson, Park, Chaudoir, & Wortmann, 2008), while optimism (labelled healthy beliefs) partially mediated the relationship between spirituality and perceptions of better life among adults with HIV/AIDS (Szafarski et al., 2006). Although studies among paediatric patients have not explicitly evaluated possible mediators of these links, they have controlled for other variables that could be conceptualised as potential mediators. For instance, paediatric patients' negative spiritual coping predicted more anxiety at one-month follow-up even after controlling for perceived health and symptom control, as well as secular coping strategies (e.g., distraction) (Benore et al., 2008), suggesting that these factors do not fully mediate the effects of spiritual coping. Additional research, particularly with paediatric populations, is needed to evaluate these mechanisms and clarify the pathways through which negative spiritual coping affects adjustment, quality of life, and health over time.

Contrary to our hypotheses, synthesis of the data under a REM revealed that positive spiritual coping was unrelated to adjustment. However, associations with fewer internalising problems and better health outcomes reached significance under the fixed effects model, reflecting the influence of several studies showing moderate to large associations (Lyon et al., 2014; Park & Nachman, 2010; Reynolds, Mrug, Britton, et al., 2014; Reynolds, Mrug, Hensler, et al., 2014; Shelton, 2004). However, there was considerable heterogeneity across studies, making it difficult to draw conclusions about these results, and underscoring the importance of quantitative syntheses that combine multiple studies to produce more generalisable estimates.

Interestingly, our effect size for positive spiritual coping and internalising problems \( (r = -0.19) \) is greater than comparable effect sizes reported in meta-analyses with adults \( (r = -0.11 \text{ and } r = -0.10; \text{ Hackney & Sanders, 2003; Smith et al., 2003}) \) and healthy adolescents \( (r = -0.11 \text{; Yonker et al., 2012}) \), but more comparable to adults experiencing mild to high stress \( (r = -0.14 \text{ and } r = -0.15; \text{ Smith et al., 2003}) \). These other, smaller effect sizes were significant because they were based on many more studies compared to our meta-analysis \( (N = 24 \text{ to } 147 \text{ vs. } 7 \text{ here}) \). Thus, continued research on the role of positive spiritual coping in internalising problems and health of youth with chronic illness may help establish reliable associations in future quantitative syntheses.

By contrast, a previous meta-analysis with adults found a stronger link between spirituality and quality of life \( (r = 0.26 \text{ based on 51 studies; Sawatzky, Ratner, & Chiu, 2005}) \) compared to our results \( (r = -0.02 \text{ based on 6 studies}) \). Together, these results suggest that the association between positive spiritual coping and internalising distress is of small magnitude and a large number of studies are needed to establish its statistical significance, but is comparable across adolescents and adults dealing with stress (e.g., medical illness). However, quality of life does not appear related to positive spiritual coping among adolescents, in contrast to a positive relationship among adults.

The mixed results for quality of life observed in our meta-analysis (i.e., moderate association between positive spiritual coping and better quality of life in Lyon et al., 2014, vs. poorer quality of life in Benore et al., 2008) may also be due to a more complex relationship between health problems, positive spiritual coping, and psychosocial adjustment. For instance, positive spiritual coping strategies may be mobilised in response to stress or a difficult situation that worsens psychosocial adjustment and quality of life, including a significant illness-related event such as hospitalisation or symptom exacerbation (Pargament et al., 1998). Mobilisation theory posits that a normative reaction to distress is to engage (or 'mobilise') available coping resources, such as positive spiritual coping strategies, in an effort to promote adjustment. However, improved adjustment may not be immediately apparent, so that early in the coping process positive spiritual beliefs may appear related to poorer adjustment or quality of life as individuals try to cope.

In fact, Benore et al. (2008) suggest that their results may reflect this phenomenon, explaining that data were collected from youth accessing emergency care and undergoing hospitalisation for acute
asthma treatment. Data from the Lyon et al. (2014) study, on the other hand, were obtained from patients during their regular outpatient clinic visits for treatment of HIV. Thus, acute illness-related events may moderate the effects of positive spiritual coping on adjustment. Other disease-related factors, such as severity of the illness, frequency or duration of hospitalisations, and time since diagnosis, may also serve as moderators of these relationships. Unfortunately, few studies examined disease-related variables as possible moderators of spiritual coping effects. Most studies addressing moderation have focused on demographic factors. For instance, investigations with adolescents generally found stronger links between spiritual coping and mental health in boys and older youth (Wong, Rew, & Slaikeu, 2006). In the adult literature, the link between spirituality and quality of life was stronger in studies utilising non-probability samples, existential measures of spirituality, and disease-specific measures of quality of life, compared to studies with probability samples, relational measures of spirituality, and general measures of quality of life (Sawatzky et al., 2005). In addition, religious coping or prayer were more strongly related to better adjustment or quality of life among Protestants (vs. Catholics) and individuals with lower levels of education (Banthia, Moskowitz, Acree, & Folkman, 2007; Tix & Frazier, 1998). Although a qualitative review of the individual study effects included in this meta-analysis (significant versus nonsignificant) did not reveal a clear pattern of differences in study characteristics, studies composed of participants with varying conditions and more diverse illness progression were more likely to evidence nonsignificant effects (Landolt et al., 2002; Zehnder et al., 2006), suggesting that these factors may explain some of the non-significant and heterogeneous findings. Research focused on identifying moderating factors and clarifying the temporal relationships between spiritual coping, adjustment, and health throughout the disease course is needed.

Temporal factors may also be responsible for the lack of relationship between positive spiritual coping and health outcomes in the current meta-analysis. For instance, the longitudinal results presented by Reynolds, Mrug, Britton, et al. (2014) showed a significant effect between positive spiritual and health outcomes over a five-year period, but the corresponding cross-sectional effect was not significant. The importance of longitudinal results is also reflected in the results of a meta-analysis with adults, which showed 29% higher odds of survival (vs. mortality) in highly religious individuals (McCullough et al., 2000). However, given the small number of studies in this meta-analysis, it was not possible to formally evaluate differences between cross-sectional and longitudinal results. Clearly, more longitudinal research on spiritual coping, psychosocial adjustment, and physical health outcomes is needed with paediatric populations.

Clinical implications

The present meta-analysis provides important clinical information about the role of spiritual coping in adjustment and health among youth with chronic or serious medical illness. Specifically, paediatric patients experiencing spiritual struggle may be at risk for internalising problems, poorer quality of life, and worse health outcomes, highlighting the need for early identification using brief, validated measures (King, Fitchett, & Berry, 2013; Pargament et al., 1998) or following guidelines outlined by the Joint Commission on Accreditation of Healthcare Organizations (JCAHO, 2008). Specifically, JCAHO (2008) suggests that providers ask patients whether ‘there are any cultural, religious, or spiritual beliefs or practices that may influence his or her care’ and if so, to consider having a chaplain complete a more formal spiritual assessment to identify specific religious practices or coping resources. For youth who endorse utilising negative spiritual coping strategies to cope with their illness, consultation with a hospital chaplain may be especially beneficial. If depression, anxiety, or other psychosocial difficulties are also suspected, a referral to a paediatric psychologist for a more comprehensive assessment of adjustment and coping would be warranted. More research is needed to determine if interventions addressing spiritual struggle improve adjustment in paediatric patients, as has been demonstrated among adults with serious medical illness (Cole, 2005), or whether existing interventions targeting psychosocial adjustment difficulties lead to the use of more adaptive spiritual
coping strategies among youth who identify spirituality as an important coping resource. Further development of spiritual coping interventions would also benefit from the incorporating theoretically based components to improve specific health behaviours (e.g., treatment adherence) (Davis, Campbell, Hildon, Hobbs, & Michie, 2015).

Limitations and future directions

The present meta-analysis had several limitations. First, generalisability was limited by the small number of studies. Having so few studies also prohibited the examination of moderators and subgroup analyses when heterogeneity was identified. Interpretation and generalisability was also limited by the predominance of participants identifying as Christian (86% across 5 studies). Although research has sought to rectify this limitation with an emergence of studies focusing on other religious traditions (Khan & Watson, 2006; Pirutinsky, Rosmarin, Pargament, & Midlarsky, 2011), more work is needed in this area, particularly among paediatric patients.

A second limitation was the variability in how individual studies operationalised and measured spiritual coping. Although an effort was made to only examine studies that assessed the use of spiritual beliefs as a coping strategy, differences among the measurement tools call into question how well the underlying construct of spiritual coping was captured in the current meta-analysis. The results may not generalise to the role of religiosity (i.e., more formal and organised behaviours related to the sacred) in adjustment and health, as all included studies assessed personal beliefs and coping strategies that are more consistent with the definition of spirituality (Hill & Pargament, 2008).

In addition, combining various indices of psychosocial adjustment and physical health may have contributed to the heterogeneity among studies and obscured meaningful relationships. As more research in this area emerges, future meta-analytic studies may benefit from examining positive and negative spiritual coping with specific indices of adjustment and health (e.g., depression and adherence), or analysing varying conceptualisations and measures of the constructs as moderators.

Finally, most of the analysed studies reported only cross-sectional relationships between spiritual coping and outcomes among paediatric patients, and due to the small number of studies differences between concurrent and prospective associations could not be formally evaluated. Thus, neither the causal relationship nor the temporal order of spiritual coping and health can be inferred from the results. Although a few studies have sought to clarify these longitudinal relationships among paediatric populations (Grossoehme et al., 2013; Reynolds, Mrug, Britton et al., 2014; Reynolds, Mrug, Hensler, et al., 2014), replication of these studies across multiple paediatric patient groups and aspects of adjustment and health outcomes is needed.

Conclusions

Despite these limitations, the present meta-analysis summarised extant literature on spiritual coping in youth with chronic or serious illness. The results revealed that negative spiritual coping strategies are related to lower quality of life, poorer health, and concurrent internalising problems. In addition, there was some support for links between positive spiritual coping and fewer internalising problems and better health outcomes. More research is needed to clarify the directionality of the relationships between spiritual coping and mental and physical health, as well as mediators and moderators of these associations. In addition, intervention research with paediatric patients facing serious medical illnesses is needed to determine if spiritual coping is modifiable and whether its targeting improves adjustment. Such intervention studies should directly assess mediators of spiritual intervention effects (e.g., improved social support or coping strategies), as well as moderators of treatment efficacy (e.g., age, initial spiritual beliefs or coping strategies).
Disclosure statement

No potential conflict of interest was reported by the authors.

References

*References preceded with an asterisk indicate studies included in the meta-analysis.


