ELSEVIER

Journal of Cystic Fibrosis 13 (2014) 593 – 600

Journal of Cystic Fibrosis

www.elsevier.com/locate/jcf

Original Article

Spiritual coping predicts 5-year health outcomes in adolescents with cystic fibrosis☆

Nina Reynolds [a,1], Sylvie Mrug [a,*,1], LaCrecia Britton [a], Kimberly Guion [b], Kelly Wolfe [c], Hector Gutierrez [a]

[a] University of Alabama at Birmingham, 1720 2nd Ave S, Birmingham, AL 35294, USA
[b] Oregon Health and Sciences University, 3181 S.W. Sam Jackson Park Rd, Portland, OR 97239-3098, USA
[c] Nationwide Children's Hospital, 700 Children's Drive, Columbus, OH 43205, USA

Received 24 September 2013; received in revised form 12 December 2013; accepted 15 January 2014
Available online 16 February 2014

Abstract

Background: Positive spiritual coping in adolescent patients with cystic fibrosis (CF) is associated with better emotional functioning, but its role in health outcomes is unknown.
Methods: Adolescents diagnosed with CF (n = 46; *M* = 14.7 years) reported on their use of positive and negative spiritual coping. Measures of nutrition status (BMIp), pulmonary function (%FEV1), and hospitalizations were obtained for a five-year follow up period. Changes in BMIp and %FEV1 scores were estimated with hierarchical linear models; days hospitalized were modeled with negative binomial regression.
Results: Positive spiritual coping was associated with slower decline in pulmonary function, stable vs. declining nutritional status, and fewer days hospitalized over the five-year period. Negative spiritual coping was associated with higher BMI percentile at baseline, but not with health outcomes over time.
Conclusions: These results suggest that positive spiritual coping plays a key role in maintaining long-term health of adolescent patients with CF.

Keywords: Spiritual coping; Psychology; Long-term outcomes

1. Introduction

Adolescents with chronic illness, including pulmonary conditions such as CF and asthma, experience more emotional and behavior problems than healthy peers [1]. In turn, these problems are linked with lower quality of life [2], poorer treatment adherence [3], and faster disease progression and mortality [4]. Spiritual beliefs play a unique role as a coping strategy, because they can provide answers to existential questions elicited by the illness (Why me? What comes after death?) and help construct higher meaning out of the illness experience. They can also provide additional social support from a god-figure when other sources are not available [5], such as during hospitalizations.

Youth with different types of chronic illness use spiritual beliefs to cope with their condition [6] (e.g., praying to get better, asking God to give me strength). Such "positive spiritual coping" is associated with better emotional functioning in youth with pulmonary and other disorders [7,8]. Not all spiritual coping beliefs, however, are helpful [9]. Specifically, feeling punished or abandoned by God, termed "negative spiritual coping," predicts more depression and anxiety among youth with CF [7] and asthma [10] and adults with chronic illness [11]. Importantly, spiritual coping remains a strong predictor of emotional problems even after accounting for

Abbreviations: CF, cystic fibrosis; BMIp, Body Mass Index percentile; %FEV1, percentage of predicted forced expiratory volume in 1 s

☆ The authors have no conflicts of interest or financial relationships relevant to this article to disclose.

* Corresponding author at: Department of Psychology, University of Alabama at Birmingham, 1720 Second Avenue South, Birmingham, AL 35294-2100, USA. Tel.: +1 205 934 3850; fax: +1 205 975 6110.
E-mail address: smrug@uab.edu (S. Mrug).

[1] These authors made equal contributions to the manuscript.

1569-1993/$ -see front matter
http://dx.doi.org/10.1016/j.jcf.2014.01.013

secular attributions [8] and other coping strategies [10]. Positive and negative spiritual coping are typically measured as dimensional scores ranging from low to high levels. Across studies, these two dimensions are either unrelated to each other [8] or positively correlated [9,10,12], suggesting that some patients utilize both positive and negative spiritual beliefs, while others use neither or only one type of spiritual beliefs.

Among adults with medical illness, positive spiritual coping is also associated with better health outcomes, including improved postoperative cardiac functioning [13], lower rates of mortality [14], and less CD4 cell count decline [15]. Conversely, negative spiritual coping predicts harmful postoperative cytokine elevations [12], higher CD4 cell count decline [16], and higher inpatient mortality [17]. In pediatric patients, only one study linked positive spiritual coping with slower retrospective pulmonary function decline among youth with CF [18]. However, no studies have evaluated the role of spiritual coping in prospective health outcomes in pediatric populations.

To address this gap, this prospective study evaluated the relationship between spiritual coping and subsequent changes in pulmonary function, malnutrition, and hospitalizations over a 5-year period in adolescent patients with CF, a life-threatening progressive genetic disorder with serious pulmonary and pancreatic complications. We hypothesized that positive spiritual coping would be associated with better health functioning over the 5-year period, while negative spiritual coping would be related to faster health decline. We expected that spiritual coping would remain a significant predictor of health outcomes even after accounting for baseline health and secular coping.

2. Methods

2.1. Participants

Participants included 46 adolescents diagnosed with CF and their primary caregivers. Adolescents were between 12 and 18 years old at baseline (M = 14.7 years, SD = 1.9) and included 50% males (n = 23), 87% Caucasians (n = 40), 11% African Americans (n = 5), and 2% Hispanics (n = 1).

2.2. Procedures

The study procedures were approved by the University's Institutional Review Board. Adolescents were recruited during outpatient medical visits at the CF clinic at a Children's Hospital in the southeast U.S. in 2008–2009 (baseline). Inclusion criteria included fluency in English and no known diagnosis of a Pervasive Developmental Disorder, Mental Retardation, or Psychosis. Parental informed consent and adolescent assent was obtained from each family. Participants completed a packet of questionnaires during their clinic visit or at home. Measures of pulmonary function (%FEV1 scores), nutritional status (BMI percentiles), hospitalizations, and medical complications were collected from patients' records in the CF Foundation registry in November 2013 (5-year follow up).

2.3. Materials

2.3.1. Spiritual coping

Adolescents completed the Brief RCOPE [9], a self-report measure of positive and negative spiritual coping strategies validated in pediatric samples [6]. Positive spiritual coping strategies include thoughts or beliefs related to seeking spiritual support (e.g., "seeking God's help in letting go of anger") or thinking about a difficult situation from a spiritual perspective (e.g., "trying to see how God might be trying to strengthen me"). Negative spiritual coping strategies, on the other hand, involve reframing the difficult situation in terms of spiritual punishment or abandonment (e.g., "wondering what I did for God to punish/abandon me") or questioning God's power. The 7 positive and 7 negative spiritual coping items were rated on a 4-point scale ("not at all" [0] to "a great deal" [3]) and averaged (α = .90 and .79). Thus, scores on the positive and negative spiritual coping scales can range from 0 to 3, with higher scores reflecting greater use of positive or negative spiritual coping. For instance, individuals with a mean score of 0 do not use any of the positive or negative spiritual coping strategies, whereas those with a mean score 3 often use all the strategies.

2.3.2. Secular coping

Secular cognitive coping was assessed with the Children's Attributional Styles Questionnaire Revised [19]. Adolescents read 24 hypothetical situations, which included 12 negative events (e.g., "A team that you are on loses a game.") and 12 positive events (e.g., "You make your friends happy."). For each event, they had to choose between two explanations for the event, with the explanations varying across locus of control (internal vs. external), stability (always vs. never will be present), or globality (general vs. specific to the situation). Explaining positive events with internal, stable, and general causes represents positive (optimistic) attributions, whereas explaining negative events by these causes is negative (pessimistic). Positive and negative attributions were calculated by summing the number of internal, stable, and general causes chosen across the 12 positive and negative scenarios, respectively (α = .53 and .52). The negative attribution scale was then subtracted from the positive attribution scale, yielding a single dimensional measure of optimistic attribution style.

2.3.3. Pulmonary function

To assess airway obstruction, patients completed the forced expiratory volume in 1 s (FEV1) test at every clinic visit. This test measures the volume exhaled during the first second of a forced expiratory maneuver started from the level of total lung capacity, and is recorded as a percentage of the normal predicted values for height, age, and sex (i.e., percent predicted FEV1, %FEV1) [20]. Higher percentages reflect better pulmonary functioning and are typically classified as normal (>90%), mild obstruction (70–89%), moderate obstruction (40–69%) or severe obstruction (<39%) [21]. Pulmonary function data were collected for every clinic visit between baseline and the end of the follow up period.