Effects of Religious vs. Conventional Cognitive-Behavioral Therapy on Purpose in Life in Clients with Major Depression and Chronic Medical Illness: A Randomized Clinical Trial

Noha Daher,[1,2] Harold G. Koenig,[3,4,5,6,7] Michelle J. Pearce,[3,4,8] Bruce Nelson,[9] Sally F. Shaw,[9] Lee S. Berk,[2,4,10] Denise Belinger,[10] Clive J. Robins,[3,11] Harvey Jay Cohen,[4,5] and Michael B. King[12].

Abstract

We examined the effects of religious cognitive-behavioral therapy (RCBT) compared to conventional CBT (CCBT) on purpose in life (PIL) in clients with major depression and chronic illness. Participants were randomized to either RCBT (n=65) or CCBT (n=67) to receive ten 50-min sessions over 12 weeks. PIL was measured at baseline, 12, and 24 weeks. Growth curve models examined the effects of treatment group on trajectory of change in PIL. While no significant difference was found between RCBT and CCBT on PIL trajectories in the overall sample, RCBT was more effective than CCBT on increasing PIL in clients who were highly religious (group by time interaction B=-5.87, SE=2.57, p=0.026, Cohen's d=0.64). Furthermore, baseline religiosity correlated positively with baseline PIL (r=0.34, p<0.0001) and predicted an increase in PIL over time (B=0.23, SE=0.05, p<0.0001). RCBT does not appear to increase PIL more than CCBT, although this may depend on the religiosity of the client.

Keywords: religious psychotherapy, CBT, purpose in life, depression, chronic medical illness

Introduction

Ryff defined well-being in terms of six dimensions: autonomy, environmental mastery, positive relationships with others, personal acceptance, and purpose in life (PIL) (Ryff, 1989; Ryff & Singer, 2006). PIL has been associated with greater high density lipoprotein and lower

[1] Epidemiology, Biostatistics, and Population Medicine, School of Public Health, Loma Linda University, Loma Linda, CA, USA
[2] Allied Health Studies, School of Allied Health Professions, Loma Linda University, Loma Linda, CA, USA
[3] Department of Psychiatry and Behavioral Sciences, Duke University Medical Center, Durham, NC, USA
[4] Center for Spirituality, Theology, and Health, Duke University, Durham, NC, USA
[5] Department of Medicine, Duke University Medical Center, Durham, NC, USA
[6] Department of Medicine, King Abdulaziz University, Jeddah, Saudi Arabia
[7] School of Public Health, Ningxia Medical University, Yinchuan, China
[8] School of Medicine, University of Maryland, Baltimore, MD, USA
[9] Department of Research, Glendale Adventist Medical Center, Glendale, CA, USA
[10] Department of Pathology and Human Anatomy, School of Medicine, Loma Linda University, Loma Linda, CA, USA
[11] Department of Psychology and Neuroscience, Duke University Medical Center, Durham, NC, USA
[12] Division of Psychiatry, Faculty of Brain Sciences, University College, London, United Kingdom

Corresponding Author
Harold G. Koenig, M.D., Box 3400 Duke University Medical Center, Durham, NC 27710, USA
Office: +1 (919) 681-6633, Fax: +1 (919) 471-3624, Email: Harold.Koenig@duke.edu

cardiovascular risk, weight, inflammatory makers, and cortisol values throughout the day (Friedman, Hayney, Dienberg Love, Singer, & Ryff, 2007; Ryff & Keys, 1995; Ryff, Singer, & Dienberg Love, 2004). A diminished sense of PIL has also been related to worse health outcomes, shorter lifespan, and physical disability (Ryff et al., 2006; Steger, Mann, Michels & Cooper, 2009). Researchers found that in community dwelling older persons without dementia greater PIL predicted less disability, better performance of day-to-day activities, less cognitive impairment, and reduced overall mortality (Boyle, Barnes, Buchman, & Bennett, 2009; Boyle, Buchman, Barnes, & Bennett, 2010; Boyle, Buchman, & Bennett, 2010). In another study of older adults in the U.S., those with higher PIL also experienced greater longevity (Krause, 2009). A recent study found that greater PIL predicts greater longevity and is important at younger ages as well (Hill & Turiano, 2014). Such findings are consistent with Viktor Frankl's (1963) assertion that the main driving force among all human beings is the desire to find purpose and meaning in life.

PIL is inversely related to a host of psychiatric disorders both directly and indirectly, especially depression. According to the World Health Organization (WHO) and Harvard School of Public Health, depression causes enormous disability and, by the year 2020, depression will be one of the top causes of disability worldwide (Michaud, Murray, & Bloom, 2001; Murray & Lopez, 1996). Nearly 15% of persons with major depression commit suicide during their lifetime (Dumais et al., 2005). Many studies have reported an inverse relationship between depression and PIL, and found that PIL predicts lower rates of depression over time (Hedberg, Gustafson, Aléx, & Brulin, 2010; Kim, Hayward, & Reed, 2014; Martin et al., 2012; Ryff, Singer, & Dienberg Love, 2004). PIL has also been shown to buffer against suicidal thoughts and may prevent premature mortality from suicide (Hill & Turiano, 2014; Wang, Lightsey, Pietruszkaa, Uruka, & Wells, 2007).

Religion has been recognized as a central source for PIL, providing individuals with beliefs, expectations, and goals that foster purpose (Batson & Stocks, 2004; Emmons, 2005; Steger & Frazier, 2005), and, like PIL, is inversely related to and predicts recovery from depression (Carl Pieper, Meador, & Sheip, 1992; Koenig, 2007; Koenig, George, & Peterson, 1998). Not surprisingly, then, PIL has been strongly related to religious involvement in many studies (Francis, Jewell, & Robbins, 2010; Huta, 2013; Litwinczuk & Groh, 2007; Sillick & Cathcart, 2014). For example, data from a longitudinal nationwide survey of older adults indicated that people with a strong sense of God-mediated control were more likely to find meaning in life than those who did not (Krause, 2010). A recent study also found that PIL was a key factor that mediated the relationship between religiosity and happiness (Aghababaei & Blachnio, 2014), and religious involvement has been associated with greater PIL and other positive emotions in persons with major depression and chronic medical illness (Koenig et al., 2014). Given the close link between PIL and religious involvement, and the inverse relationship between both of these constructs and depressive symptoms, we decided to examine changes in PIL in response to a religious intervention in depressed persons with chronic medical illness.

Objectives

The purpose of this secondary analysis of trial data was to examine the effects of religiously-integrated cognitive behavioral therapy (RCBT) versus conventional CBT (CCBT) on PIL in a cohort of persons with major depression and disabling chronic medical illness. We hypothesized that (1) PIL would increase more during the course of therapy in those receiving RCBT than in those receiving CCBT, (2) the effect would be stronger in those who were more religious, and (3)

baseline religiosity would predict increases in PIL over time and baseline PIL would predict faster decline in depressive symptoms, independent of treatment group.

Methods

Study Population

A detailed description of the parent study has been provided elsewhere (Koenig et al., 2015), although we summarize the methods here. Persons ages 18-85 were recruited from two sites, one in Durham County, North Carolina, and the other in Los Angeles County, California. Inclusion criteria were (1) one or more medical illness of six months duration or longer; (2) religion or spirituality at least somewhat important; (3) a DSM-IV diagnosis of major depressive disorder using the MINI Neuropsychiatric Inventory (Sheehan et al., 1998); and (4) mild to moderate depressive symptoms, defined as a Beck Depression Inventory (BDI) score of 10 to 40 (Beck et al., 1961). Exclusion criteria were (1) significant cognitive impairment; (2) receipt of psychotherapy in the past two months; (3) history of psychotic disorder, alcohol or substance abuse, post-traumatic stress disorder within the past year, or a lifelong history of bipolar disorder; (4) active suicidal thoughts; (5) diagnosis of HIV/AIDS, autoimmune diseases, dementia, or endocrine disorders affecting stress hormone levels, or taking immunosuppressant drugs; (6) inability to communicate in English; and (7) lack of remote access such as a telephone or the Internet. Individuals who met these criteria were enrolled in the trial.

Procedures

The design was a randomized clinical trial that involved the administration of CBT remotely. All follow-up assessments were self-rated with minimal assistance. The study was performed in two phases that involved separate samples. In Phase I (n=39), the delivery method preferred by participants was determined. Options included telephone, Skype, or instant messaging. Follow-up assessments for the Phase I sample were done at 4, 8, and 12 weeks from baseline. During Phase II (n=93), all treatment sessions were conducted by telephone and a 24-week follow-up was added at 12 weeks following the end of therapy. Since screening, recruitment, randomization, interventions, and all assessments were essentially the same for Phase I and Phase II samples, we combined them for analysis. Study phase had no significant effect on treatment outcome based on inclusion in the growth curve model.

Therapists

Eight master's level therapists delivered the therapy. CCBT therapists had no experience integrating religious beliefs into therapy, while RCBT therapists were experienced integrating religious beliefs into therapy. Therapists delivering both interventions were trained and supervised by Duke Faculty skilled in CCBT or in both CCBT and RCBT. In order to qualify as a study therapist, a score of 40 or higher was required on the cognitive therapy rating scale (CTRS) (Vallis, Shaw, & Dobson, 1986; Young & Beck, 1980).

Interventions

The intervention in each group consisted of ten 50-minute sessions administered over 12 weeks, 94% of which were delivered remotely by telephone. Conventional CBT was a manual-based therapy for depression following CBT as described by Aaron Beck (Beck et al., 1979), including behavioral activation and the identification and challenging of negative thoughts. When

participants raised religious issues, CCBT therapists were instructed to redirect participants to more secular topics. Religious CBT was a manual-based intervention developed directly from the CCBT manual above, but emphasized and integrated participants' religious beliefs into the therapy (Pearce et al., 2015). The RCBT intervention was conducted using manuals that integrated religious beliefs based on Christianity, Judaism, Islam, Hinduism, or Buddhism, depending on the participant's faith tradition.

Both CCBT and RCBT included activities that focused on forgiveness, mindfulness meditation (only for Buddhists in RCBT), gratefulness, and involvement in social activities. Both interventions adapted CBT to address dysfunctional cognitions related to chronic illness and disability. The therapies were similar in all aspects except that RCBT integrated the participants' religious beliefs into the therapy and served as the rationale for behavioral activation and for the challenging of negative cognitions.

Therapists' adherence to the treatment manuals, competence, and quality of therapy were documented using an adapted version of the Adherence Rating Scale (ARS) based on tape-recorded and transcribed sessions (Waltz, Addis, Koerner, & Jacobson, 1993). Trained and supervised therapists not directly involved in the study rated the transcripts.

Measures

The BDI assessed severity of depressive symptoms at baseline and the course of depressive symptoms during and following treatment. Physical functioning (Hlatky et al., 1989), cognitive functioning (Koenig, 1996), severity of medical illness (Linn, Linn, & Gurel, 1968), medical co-morbidity (Charlson, Pompei, Ales, & Mackenzie, 1987), and social support (Landerman, George, Campbell, & Blazer, 1989) were assessed using standard measures as described in Koenig et al. (2015).

Religious involvement was measured with single items assessing importance of religion, religious attendance, and private religious activity, and multi-item measures of spiritual experiences (Underwood & Teresi, 2002) and intrinsic religiosity (Hoge, 1972). Religious importance, religious attendance, private religious activity, daily spiritual experiences, and intrinsic religiosity were summed to create a 29-item overall religiosity scale (alpha=0.95). Participants scoring at 70% or higher on this scale were defined as highly religious.

The primary outcome examined in this report was purpose in life, which was assessed using the Purpose in Life (PIL) Scale (Ryff, 1989). This 20-item scale assesses PIL based on theories about positive psychological health and lifespan development. Each item is rated on a 7-point scale and the total PIL score ranges from 20 to 140 (Seeman, 1991). High scores on the PIL scale indicate that participants have goals and a sense of direction in life, feel that there is meaning to their lives both currently and in the past, hold beliefs that give life purpose, and have aims and objectives for living; low scores reflect lack of meaning or direction in life, few goals, and inability to see purpose in past events (Ryff & Keyes, 1995). The reliability and validity of the PIL scale has been widely established (Ryff, 1989; Ryff & Keyes, 1995; Ryff, Lee, Essex, & Schmutte, 1994). The measure has been shown to have good split-half and test-retest reliability (Seeman, 1991; Zika & Chamberlain, 1992). The PIL scale had a Cronbach's alpha of 0.91 in the original study (Chamberlain & Zika, 1988), and there is evidence for both convergent and discriminant validity (Seeman, 1991).

Comparison of trajectories of change in PIL score from baseline through 24 weeks between treatment groups in all randomized participants (intent-to-treat) was the primary outcome. Secondary outcomes were (1) trajectories of change in PIL scores in (a) Christian

participants only, (b) highly religious participants only, and (c) those completing at least 5 of the 10 therapy sessions (per-protocol); and (2) effects of baseline religiosity on changes in PIL and effects of baseline PIL on changes in depressive symptoms.

Statistical Analyses

The baseline characteristics of participants between treatment groups were compared using Student's t-test for continuous variables and the chi-square statistic for categorical variables. Growth curve modeling using random intercept and slope (mixed effect regression models) was used to examine the effect of the PIL score on trajectory of change in BDI over time. The model included treatment group, time, time-squared, and group by time interaction. This method allowed for participants with data for at least one time point to be included in the analysis and helped to address the problem of missing data. Baseline PIL was also examined as a predictor of depression trajectory (PIL, treatment group, time, time-squared), and baseline religiosity was examined as a predictor of PIL trajectory (religiosity, treatment group, time, time-squared). Effect sizes (Cohen d), degrees of freedom (df) and t-value were obtained from output of mixed models. Significance level was set at $p<0.05$ for the primary endpoint (trajectory of PIL scores from baseline through 24 weeks) and for secondary endpoints as well, given the exploratory nature of these analyses. All statistical analyses were performed using SAS (version 9.3; SAS Institute Inc., Cary, North Carolina).

Results

Of the 132 participants enrolled in the study, all completed the baseline PIL test, 95 completed it at 12 weeks and 68 at 24 weeks (see Figure 1). A comparison of baseline characteristics of the participants by treatment group is displayed in Table 1; there was no significant difference between treatment groups on these characteristics.

The mean PIL score for all participants was 86.6 (SD=16.2, range 41-123) at baseline, 102.0 (SD=18.3, range 56-135) at 12 weeks on completion of therapy, and 101.9 (SD=19.4, range 61-139) three months later. There were no significant differences in PIL scores between CCBT and RCBT at any time point examined in both the intention-to-treat (ITT) and the per-protocol (PP) analyses in the overall sample (see Table 2). Similar findings were observed among Christians (88% of the sample) in both ITT and PP analyses. Among participants in the ITT group who were highly religious, however, the average PIL score in the CCBT group at baseline was significantly higher compared to the RCBT group (100.3 ± 11.5 vs. 88.8 ± 17.8, $p=0.02$). This relative advantage for CCBT disappeared by 12 weeks (112.4 ± 13.8 vs. 112.8 ± 16.3, $p=0.94$) and at 24 weeks (109.3 ± 14.0 vs. 111.8 ± 21.8, $p=0.74$) (see Figure 2).

In the ITT analysis for the primary hypothesis, the finding from the random coefficient's regression model predicting trajectory of PIL scores by treatment group indicated that participants receiving CCBT and RCBT were equally likely to show an increase in PIL score over time (group by time interaction: B=-1.22, SE=1.63, p=0.45, t=-0.75, p=0.45, Cohen's d=0.12, slightly favoring RCBT).

Similar findings were present among Christians only and in the PP analyses (Table 3). However, in the ITT analyses among participants scoring 70% or higher on the combined religiosity measure (i.e., the highly religious, n=40), those who received RCBT showed a significantly greater increase in PIL over time compared to those receiving CCBT (group by time interaction B=-5.87, SE=2.57, df=52, t=-2.29, p=0.026, Cohen's d=0.64).

Baseline PIL scores correlated positively with overall religiosity ($r=0.34$, $p<0.0001$) and negatively correlated with depressive symptoms ($r=-0.54$, $p<0.001$) ($n=132$). Baseline religiosity scores had a positive effect on the trajectory of increase in PIL scores over time ($B=0.23$, $SE=0.05$, $df=160$, $t=4.53$, $p<0.0001$, Cohen's $d= 0.72$). Baseline PIL scores predicted trajectory of decline in depressive symptoms from baseline through the 24-week follow-up, regardless of treatment group ($B=-0.25$, $SE=0.03$, $df=301$, $t=-7.14$, $p<0.0001$, Cohen's $d=0.82$).

Discussion

This is the first study in clients with chronic medical illness and major depressive disorder to examine the effects of a religiously-integrated form of CBT compared to conventional CBT on changes in PIL over time. Our primary hypothesis was that RCBT would increase PIL to a greater extent during and after treatment compared to CCBT. This hypothesis was not confirmed in the ITT or PP analyses in the overall group or among Christian clients. However, we did find that RCBT was more likely than CCBT to increase PIL among highly religious clients (those scoring in the top 30% on the combined religiosity measure). Finally, religiosity and PIL scores were positively correlated at baseline, and higher baseline religiosity predicted a more rapid increase in PIL over time, regardless of treatment group.

Interpretation

As noted in the introduction, many studies have reported a link between religiosity and purpose or meaning in life. Sigmund Freud, who was not sanguine about the role of religion in psychological health, wrote in 1930, "Only religion can answer the question of the purpose of life. One can hardly be wrong in concluding that the idea of life having a purpose stands and falls with the religious system" (p. 25). Unexpected, then, was the finding that a form of CBT which integrates religious beliefs and practices into therapy did *not* increase PIL more quickly than conventional CBT, especially in clients who were all at least somewhat religious or spiritual. One reason may be that an emphasis on PIL in the setting of chronic illness was part of the therapy in both treatment groups, with the only difference being that PIL was linked to religious beliefs in RCBT, whereas CCBT addressed PIL more generally. Both treatment approaches were virtually the same in every respect except for the use and integration of clients' religious beliefs into therapy. Apparently the latter did not matter for the majority of participants. Although this study was not powered to show a difference between treatment groups on change in PIL, the effect size (that slightly favored RCBT) was quite small in the overall sample ($d=0.12$).

Perhaps a religiously-integrated therapeutic approach that focused more on PIL might have had a greater effect. For example, Meaning Centered Group Psychotherapy (MCGP) is a therapeutic approach based on the writings of Viktor Frankl that is designed to help medically ill clients with advanced cancer to sustain or enhance a sense of meaning and purpose in their lives (Greenstein & Breitbart, 2000). This approach, while it does not specifically integrate clients' religious beliefs into therapy, has been shown to impact meaning and purpose measured using a subscale of the FACIT-Sp (Breitbart et al., 2010). Adding a religious element to this treatment might have had even a greater impact, especially for highly religious clients.

In this study, however, the religiosity of participants did relate to their PIL. First, religiosity was positively related to PIL at baseline. Second, those with higher baseline religiosity were more likely than those who were less religious to experience an increase in PIL, irrespective of treatment group. Third, RCBT was more likely than CCBT to increase PIL during

and following treatment in the highly religious, and the effect size was robust (d=0.64). This finding may be due to a regression-to-the-mean, given that those in the CCBT group at baseline were lower on PIL than those in the RCBT group. However, the finding could also mean that religiously-integrated CBT in those with strong religious beliefs may be particularly effective in increasing PIL. Also, greater PIL at baseline was a significant predictor of a decline in depressive symptoms among clients with major depression, regardless of treatment group, indicating that these effects may have other clinical consequences as well.

Limitations and Strengths

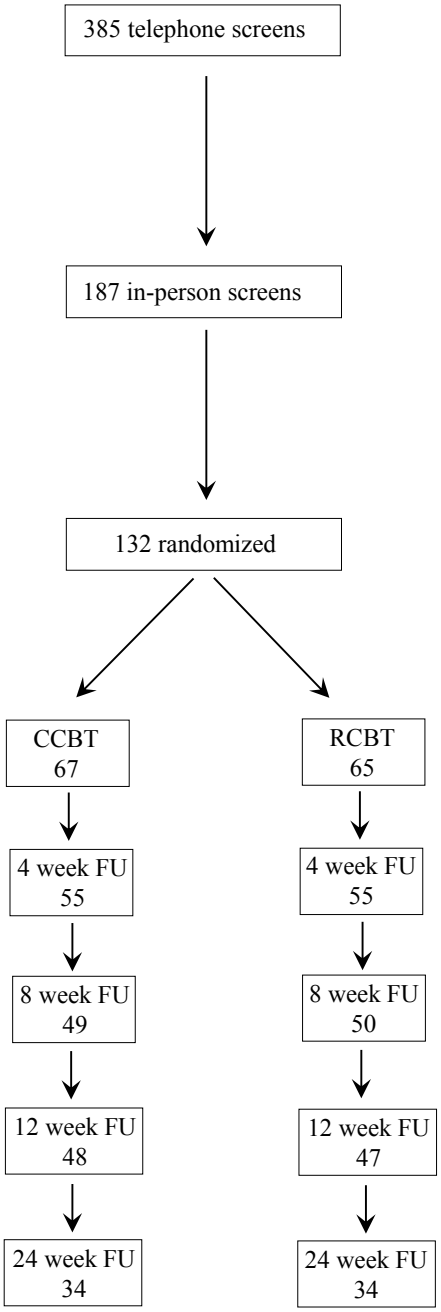
As noted above, the greatest limitation of this analysis is that the primary study was not designed to compare the effects of RCBT vs. CCBT on PIL, but rather on depressive symptoms. Our finding of no difference between treatment arms also does not mean that RCBT and CCBT were similar in increasing PIL for the overall sample. Although RCBT was more effective than CCBT in highly religious clients, our classification as "highly religious" was (although *a priori)* somewhat arbitrarily defined as those scoring in the top 30% on the combined religiosity scale.

The study had several strengths. First, it was a randomized clinical trial that utilized a manual-based religiously integrated CBT intervention directed at the specific religious beliefs of clients (Christian, Buddhist, Hindu, Muslim, Jewish), and is the first study to our knowledge to examine effects on PIL in those with major depression and chronic medical illness. Second, a standard measure of PIL with solid psychometric properties was used to assess the primary outcome; this measure has been consistently related to measures of psychological state, depression, morale, happiness, and self-esteem in prior research. Third, participants came from a wide range of religious groups identified from the southeastern and southwestern U.S., two sites with quite diverse sociocultural backgrounds. Lastly, the design and statistical methods that enabled us to use growth curve modeling to examine effects of treatment group and baseline factors on changes in PIL during treatment and three months later in a relatively large sample.

Conclusions

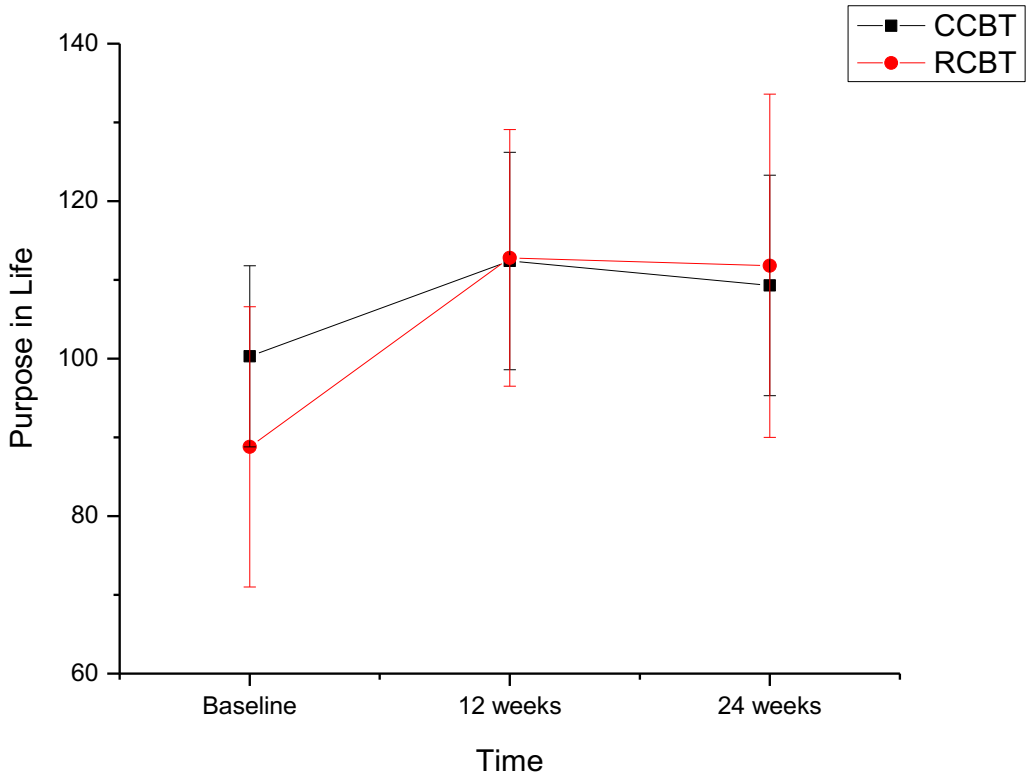
Religiously integrated CBT was no more effective than conventional CBT in increasing PIL during the course of therapy or up to three months later. However, RCBT does appear to be more effective than CCBT on increasing PIL in those who are highly religious, and although this was a secondary hypothesis, the findings make sense based on what is known about religiosity and PIL from the literature (and the finding that baseline religiosity predicted changes in PIL over time). To adequately compare the effectiveness of CCBT vs. RCBT with respect to PIL in the overall population, future clinical trials with sample sizes powered for a non-inferiority trial are needed to confirm that CCBT is not less effective than RCBT overall in those who are at least somewhat religious or spiritual. Similarly, future trials are needed to confirm that RCBT is more effective than CCBT on increasing PIL in highly religious subjects with both major depression and chronic medical illness.

Figure 1: Recruitment diagram



CCBT=Conventional Cognitive Behavioral Therapy; RCBT=Religiously-integrated Cognitive Behavioral Therapy; FU=follow-up. Figure adapted from Koenig et al. (2015).

Figure 2: Effects of religious vs. conventional CBT on PIL among the highly religious (n=40).



RCBT = religiously-integrated cognitive behavioral therapy
CCBT = conventional cognitive behavioral therapy

Table 1: Baseline characteristics by treatment group (n=132)

	CCBT (n=67)	**RCBT** (n=65)
Demographics		
Gender (female), % (n)	65.7 (44)	72.3 (47)
Age (years), mean (SD)	52.5 (13.7)	50.7 (13.3)
Race (white), % (n)	58.2 (39)	47.7 (31)
Education (years), mean (SD)	15.2 (3.2)	15.0 (3.5)
Marital status (married), % (n)	41.8 (28)	36.9 (24)
Religious characteristics		
Christian affiliation, % (n)	92.5 (62)	83.1 (54)
Importance (very), % (n)	44.8 (30)	49.2 (32)
Attendance (=/>weekly), % (n)	41.8 (28)	43.1 (28)
Prayer (=/> daily), % (n)	38.8 (26)	35.4 (23)
Intrinsic (IRS), mean (SD)	34.5 (8.3)	35.2 (8.4)
Experiences (DSE), mean (SD)	57.5 (16.1)	57.7 (15.9)
Physical illness severity		
Physical function (DASI), mean (SD)	29.1 (5.6)	28.7 (5.9)
Severity (CIRS), mean (SD)	6.5 (4.7)	7.1 (5.7)
Comorbidity (CCI), mean (SD)	2.9 (2.8)	2.3 (2.2)
Depression		
Symptoms (BDI), mean (SD)	25.8 (9.2)	24.6 (7.2)
Onset (past 12 mo), % (n)	70.1 (47)	73.8 (48)
Recurrent depression (>2), % (n)	76.1 (51)	70.8 (46)
Study design		
Manual fidelity, mean (SD)[1]	31.9 (4.5)	31.8 (3.8)
Site (Durham), % (n)	47.8 (32)	46.2 (30)
Phase (II), % (n)	70.1 (47)	70.8 (46)
RCBT type, % (n)		
Christian	----	83.1 (54)
Non-Christian	----	16.9 (11)

SD=Standard Deviation; IRS=Intrinsic Religiosity Scale; DSE=Daily Spiritual Experiences scale; CCI=Charlson Comorbidity Scale; DASI=Duke Activity Status Index; CIRS=Cumulative Illness Rating Scale; BDI=Beck Depression Inventory; CTS=Cognitive Rating Scale; CBT=Cognitive Behavioral Therapy; CCBT=Conventional CBT; RCBT=Religiously-Integrated CBT[1] n=42 for CCBT group, n=43 for RCBT group

Table 2. Average Purpose in Life Scale score by treatment group

	CCBT *Mean (SD)*	**RCBT** *Mean (SD)*	**t value**	**p**
All Participants				
PIL at baseline (n=67/65)	87.7 (16.0)	85.4 (16.5)	0.82	0.42
PIL at 12 wk (n=48/47)	100.7 (19.2)	103.3 (17.5)	-0.69	0.49
PIL at 24 wk (n=34/34)	102.5 (18.3)	101.3 (20.7)	0.25	0.80
Participants (Christian)				
PIL at baseline (n=62/54)	86.9 (15.9)	85.6 (15.9)	0.45	0.65
PIL at 12 wk (n=43/47)	100.5 (20.0)	104.8 (16.6)	-1.02	0.31
PIL at 24 wk (n=29/27)	101.7 (19.1)	101.0 (21.3)	0.13	0.90
Participants (highly religious)				
PIL at baseline (n=20/20)	100.3 (11.5)	88.8 (17.8)	2.44	0.02
PIL at 12 wk (n=16/16)	112.4 (13.8)	112.8 (16.3)	-0.07	0.94
PIL at 24 wk (n=11/12)	109.3 (14.0)	111.8 (21.8)	-0.33	0.74
Per-protocol (all)				
PIL at baseline (n=46/47)	87.1 (17.1)	85.5 (16.9)	0.44	0.66
PIL at 12 wk (n=45/43)	100.2 (19.6)	103.3 (17.6)	-0.76	0.45
PIL at 24 wk (n=31/30)	103.2 (18.6)	101.2 (20.5)	0.40	0.69
Per-protocol (Christian)				
PIL at baseline (n=41/36)	85.9 (17.1)	85.9 (16.1)	-0.01	0.99
PIL at 12 wk (n=40/33)	100.0 (20.5)	104.9 (16.7)	-1.11	0.27
PIL at 24 wk (n=26/33)	102.4 (19.6)	100.8 (21.2)	0.27	0.79
Per-protocol (highly religious)				
PIL at baseline (n=14/18)	98.7 (12.7)	85.9 (16.1)	1.65	0.11
PIL at 12 wk (n=14/16)	112.3 (14.6)	112.8 (16.3)	-0.08	0.94
PIL at 24 wk (n=9/12)	110.6 (14.6)	111.8 (21.8)	-0.15	0.88

PIL=Purpose in Life Scale score, CCBT=Conventional Cognitive Behavioral Therapy, RCBT=Religiously-Integrated Cognitive Behavioral Therapy, wk=weeks, SD=standard deviation, p=significance level

Table 3: Effect of RCBT vs. CCBT on trajectory of change in purpose in life from baseline through 24 weeks

	B	**SE**	**p**
All Participants (n=132)			
Main effect of group	2.56	3.89	0.51
Group x time interaction	-1.22	1.63	0.45
Time x Time	-7.60	1.34	<0 .0001
Participants (Christian) (n=116)			
Main effect of group	1.36	4.21	0.74
Group x time interaction	-1.04	1.83	0.57
Time x Time	-8.24	1.50	<0 .0001
Participants (highly religious) (n=40)			
Main effect of group	16.7	6.40	0.01
Group x time interaction	-5.87	2.57	0.03
Time x Time	-9.17	2.12	<0.0001
Per-protocol (all) (n=93)			
Main effect of group	0.58	4.69	0.90
Group x time interaction	-0.44	1.76	0.81
Time x Time	-7.37	1.42	<0.0001
Per-protocol (Christian) (n=77)			
Main effect of group	-1.56	5.24	0.77
Group x time interaction	-0.02	2.01	0.99
Time x Time	-8.02	1.62	<0.0001
Per-protocol (highly religious) (n=32)			
Main effect of group	11.81	7.19	0.11
Group x time interaction	-4.14	2.74	0.14
Time x Time	-9.06	2.22	<0.001

CCBT=conventional cognitive behavioral therapy, RCBT=religiously-integrated cognitive behavioral therapy; B is unstandardized coefficient (CCBT=0, RCBT=1) from mixed effects growth curve models; SE= standard error, p=significance level

Declaration of Conflicting Interests

None of the authors have a financial interest in the research, have a conflict of interest of any kind, or will be receiving benefit (other than academic benefit) from the direct applications of this research.

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References

Aghababaei, N., & Blachnio, A. (2014). Purpose in life mediates the relationship between religiosity and happiness: Evidence from Poland. *Mental Health, Religion & Culture*, *17*(8), 827-831. doi:10.1080/13674676.2014.928850

Batson, C. D., & Stocks, E. L. (2004). Religion: Its core psychological functions. In J. Greenberg, S. L. Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp. 141-155). New York, NY: Guilford Press.

Beck, A. T., Rush, A. J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York, NY: Guilford Press.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J., & Erbaugh, J. (1961). An inventory for measuring depression. *Archives of General Psychiatry*, *4*, 561-571.

Boyle, P. A., Barnes, L. L., Buchman, A. S., & Bennett, D. A. (2009). Purpose in life is associated with mortality among community-based older persons. *Psychosomatic Medicine*, *71*(5), 574–579. doi:10.1097/PSY.0b013e3181a5a7c0.

Boyle, P. A., Buchman, A. S., Barnes, L. L., & Bennett, D. A. (2010). Effect of a purpose in life on risk of incident Alzheimer disease and mild cognitive impairment in community-dwelling older persons. *Archives of General Psychiatry*, *67*(3), 304-310. doi:10.1001/archgenpsychiatry.2009.208

Boyle, P. A., Buchman, A. S., & Bennett, D. A. (2010). Purpose in life is associated with a reduced risk of incident disability among community-dwelling older persons. *American Journal of Geriatric Psychiatry*, *18*(12), 1093-1102. doi:10.1097/JGP.0b013e3181d6c259

Breitbart, W., Rosenfeld, B., Gibson, C., Pessin, H., Poppito, S., Nelson, C., … Olden, M. (2010). Meaning-centered group psychotherapy for patients with advanced cancer: A pilot randomized controlled trial. *Psychooncology*, *19*(1), 21-28. doi:10.1002/pon.1556

Carl Pieper, D. P. H., Meador, K. G., & Sheip, F. (1992). Religious coping and depression among elderly, hospitalized medically ill men. *American Journal of Psychiatry*, *1*(49), 1-2. doi:10.1176/ajp.149.12.1693

Chamberlain, K., & Zika, S. (1988). Religiosity, life meaning, and wellbeing: Some relationships in a sample of women. *Journal for the Scientific Study of Religion*, *27*, 411-420. doi:10.2307/1387379

Charlson, M. E., Pompei, P., Ales, K. L., & Mackenzie, C. R. (1987). A new method of classifying prognostic comorbidity in longitudinal studies: Development and validation. *Journal of Chronic Disease*, *40*(5), 373-383. doi:10.1016/0021-9681(87)90171-8

Dumais, A., Lesage, A. D., Alda, M., Rouleau, G., Dumont, M., Chawky, N., … Turecki, G. (2005). Risk factors for suicide completion in major depression: A case-control study of impulsive and aggressive behaviors in men. *American Journal of Psychiatry*, *162*(11), 2116-2124. doi:10.1176/appi.ajp.162.11.2116

Emmons, R. A. (2005). Striving for the sacred: Personal goals, life meaning, and religion. *Journal of Social Issues*, *61*, 731-745. doi:10.1111/j.1540-4560.2005.00429.x

Francis, L. J., Jewell, A., & Robbins, M. (2010). The relationship between religious orientation, personality, and purpose in life among an older Methodist sample. *Mental Health, Religion & Culture*, *13*(7-8), 777-791. doi:10.1080/13674670802360907

Frankl, V. E. (1963). *Man's search for meaning*. New York, NY: Washington Square Press.

Friedman, E. M., Hayney, M., Dienberg Love, G., Singer, B. H., & Ryff, C. D. (2007). Plasma interleukin-6 and soluble IL-6 receptors are associated with psychological well-being in aging women. *Health Psychology*, *26*(3), 305-313. doi:10.1037/0278-6133.26.3.305

Freud, S. (1962). Civilization and its discontents. In J. Strachey (Ed., Trans.), *Standard edition of the complete psychological works of Sigmund Freud*. London, UK: Hogarth Press. (Original work published 1930)

Greenstein, M., & Breitbart, W. (2000). Cancer and the experience of meaning: A group psychotherapy program for people with cancer. *American Journal of Psychotherapy*, *54*(4), 486-500.

Hedberg, P., Gustafson, Y., Aléx, L., & Brulin, C. (2010). Depression in relation to purpose in life among a very old population: A five-year follow-up study. *Aging and Mental Health*, *14*(6), 757-763. doi:10.1080/13607861003713216

Hill, P. L., & Turiano, N. A. (2014). Purpose in life as a predictor of mortality across adulthood. *Psychological Science*, *25*(7), 1482-1486. doi:10.1177/0956797614531799

Hlatky, M. A., Boineau, R. E., Higginbotham, M. B., Lee, K. L., Mark, D. B., Califf, R. M., Cobb, F. R., & Pryor, D. B. (1989). A brief self-administered questionnaire to determine functional capacity (The Duke Activity Status Index). *The American Journal of Cardiology*, *64*(10), 651-654. doi:10.1016/0002-9149(89)90496-7

Hoge, D. R. (1972). A validated intrinsic religious motivation scale. *Journal for the Scientific Study of Religion*, *11*(4), 369-376. doi:10.2307/1384677

Huta, V. (2013). Eudaimonia. In S. David, I. Boniwell, & A. C. Ayers (Eds.), *Oxford Handbook of Happiness* (pp. 201-213). New York, NY: Oxford University Press.

Kim, S. S., Hayward, R. D., & Reed, P. G. (2014). Self-transcendence, spiritual perspective, and sense of purpose in family caregiving relationships: A mediated model of depression symptoms in Korean older adults. *Aging and Mental Health*, *18*(7), 905-913.

Koenig, H. G. (1996). An abbreviated Mini-Mental State Exam for medically ill elders. *Journal of the American Geriatrics Society*, *44*(2), 215-216.

Koenig, H. G. (2007). Religion and remission of depression in medical inpatients with heart failure/pulmonary disease. *Journal of Nervous and Mental Disease*, *195*(5), 389-395. doi:10.1097/NMD.0b013e31802f58e3

Koenig, H. G., Berk, L. S., Daher, N. S., Pearce, M. J., Bellinger, D. L., Robins, C. J., Nelson, B., Shaw, S. F., Cohen, H. J., & King, M. B. (2014). Religious involvement is associated with greater purpose, optimism, generosity and gratitude in persons with major depression and chronic medical illness. *Journal of Psychosomatic Research*, *77*(2), 135-143. doi:10.1016/j.jpsychores.2014.05.002

Koenig, H. G., George, L. K., & Peterson, B. L. (1998). Religiosity and remission of depression in medically ill older patients. *American Journal of Psychiatry*, *155*(4), 536-542. doi:10.1176/ajp.155.4.536

Koenig, H. G., Pearce, M. J., Nelson, B., Shaw, S. F., Robins, C. J., Daher, N. S., Cohen, H. J., Berk, L. S., Bellinger, D. L., Pargament, K. I., Rosmarin, D. H., Vasegh, S., Kristeller, J., Juthani, N., Douglas, N., & King, M. B. (2015). Religious vs. conventional cognitive-behavioral therapy for major depression in persons with chronic medical illness. *Journal of Nervous and Mental Disease*, *203*(4), 243-251. doi:10.1097/NMD.0000000000000273

Krause, N. (2009). Meaning in life and mortality. *Journal of Gerontology*, *64B*(4), 517-527. doi: 10.1093/geronb/gbp047

Krause, N. (2010). God-mediated control and change in self-rated health. *International Journal for the Psychology of Religion*, *20*(4), 267-287. doi:10.1080/10508619.2010.507695

Landerman, R., George, L. K., Campbell, R. T., & Blazer, D. G. (1989). Alternative models of the stress buffering hypothesis. *American Journal of Community Psychology*, *17*(5), 625-642. doi:10.1007/BF00922639

Linn, B. S., Linn, M. W., & Gurel, L. (1968). Cumulative Illness Rating Scale. *Journal of the American Geriatrics Society*, *16*(5), 622-626. doi:10.1111/j.1532-5415.1968.tb02103.x

Litwinczuk, K. M., & Groh, C. J. (2007). The relationship between spirituality, purpose in life, and well-being in HIV-positive persons. *Journal of the Association of Nurses in AIDS Care*, *18*(3), 13-22. doi:10.1016/j.jana.2007.03.004

Martin, N. H., Janssen, A., McCrone, P., Lyall, R., Landau, S., Dougherty, A., Sakel, M., Higginson, I., Shaw, C., Al-Chalabi, A., Leigh, P. N., & Goldstein, L. H. (2012). Predictors of mood in amyotrophic lateral sclerosis: Physical and psychological factors. *Journal of Neurology, Neurosurgery, & Psychiatry*, *83*(10), e1. doi:10.1136/jnnp-2012-303538.29

Michaud, C. M., Murray, C. J., & Bloom, B. R. (2001). Burden of disease—Implications for future research. *Journal of the American Medical Association*, *285*(5), 535-539. doi:10.1001/jama.285.5.535.

Murray, C., & Lopez, A. (1996). *The global burden of disease*. Cambridge, MA: Harvard University Press.

Pearce, M. J., Koenig, H. G., Robins, C. J., Nelson, B., Shaw, S. F., Cohen, H. J., & King, M. B. (2015). Religiously integrated cognitive behavioral therapy: A new method of treatment for major depression in patients with chronic medical illness. *Psychotherapy*, *52*(1), 56-66. doi:10.1037/a0036448

Ryff, C. D. (1989). Beyond Ponce de Leon and life satisfaction: New directions in quest of successful ageing. *International Journal of Behavioral Development*, *12*(1), 35-55. doi:10.1177/016502548901200102

Ryff, C. D., Dienberg Love, G., Urry, H. L., Muller, D., Rosenkranz, M. A., Friedman, E. M., Davidson, R. J., & Singer, B. (2006). Psychological well-being and ill-being: Do they have distinct or mirrored biological correlates? *Psychotherapy & Psychosomatics*, *75*(2), 85-95. doi:10.1159/000090892

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personal and Social Psychology*, *69*(4), 719-727. doi:10.1037/0022-3514.69.4.719

Ryff, C. D., Lee, Y. H., Essex, M. J., & Schmutte, P. S. (1994). My children and me: Midlife evaluations of grown children and of self. *Psychology and Aging*, *9*(2), 195-205. doi:10.1037/0882-7974.9.2.195

Ryff, C. D., & Singer, B. H. (2006). Best news yet on the six-factor model of well-being. *Social Science Research*, *35*(4), 1103-1119. doi:10.1016/j.ssresearch.2006.01.002

Ryff, C. D., Singer, B. H., & Dienberg Love, G. (2004). Positive health: Connecting well-being with biology. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *359*(1449), 1383-1394. doi:10.1098/rstb.2004.1521

Seeman, M. (1991). Alienation and anomie. In J. P. Robinson, P. R. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (Vol. 1, pp. 291-371). San Diego, CA: Academic Press.

Sheehan, B. V., Lecrubier, Y., Sheehan, K. H., Amorim, P., Janavs, J., Weiller, E., Hergueta, T.,

Baker, R., & Dunbar, G. C. (1998). The Mini International Neuropsychiatric Interview (MINI): The development and validation of structured diagnostic psychiatric interview for DSM-IV and ICD-10. *Journal of Clinical Psychiatry*, *59*(Suppl 20), 22-33.

Sillick, W. J., & Cathcart, S. (2014). The relationship between religious orientation and happiness: the mediating role of purpose in life. *Mental Health, Religion & Culture*, *17*(5), 494-507. doi:10.1080/13674676.2013.852165

Steger, M. F., & Frazier, P. (2005). Meaning in life: One link in the chain from religiousness to well-being. *Journal of Counseling Psychology*, *52*(4), 574-582. doi:10.1037/0022-0167.52.4.574

Steger, M. F., Mann, J. R., Michels, P., & Cooper, T. C. (2009). Meaning in life, anxiety, depression, and general health among smoking cessation patients. *Journal of Psychosomatic Research*, *67*(4), 353-358. doi:10.1016/j.jpsychores.2009.02.006

Underwood, L. G., & Teresi, J. A. (2002). The daily spiritual experiences scale: Development, theoretical description, reliability, exploratory factor analysis, and preliminary construct validity using health-related data. *Annals of Behavioral Medicine*, *24*(1), 22-33. doi:10.1207/S15324796ABM2401_04

Vallis, T. M., Shaw, B. G., & Dobson, K. S. (1986). The Cognitive Therapy Scale: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *54*(3), 381-385. doi: 10.1037/0022-006X.54.3.381

Waltz, J., Addis, M. E., Koerner, K., & Jacobson, N. S. (1993). Testing the integrity of a psychotherapy protocol: Assessment of adherence and competence. *Journal of Consulting and Clinical Psychology*, *61*(4), 620-630. doi:10.1037/0022-006X.61.4.620

Wang, M. C., Lightsey, O. R., Pietruszkaa, T., Uruka, A. C., & Wells, A. G. (2007). Purpose in life and reasons for living as mediators of the relationship between stress, coping, and suicidal behavior. *Journal of Positive Psychology*, *2*(3), 195-204. doi:10.1080/17439760701228920

Young, J., & Beck, A. (1980). *Cognitive Therapy Scale: Rating Manual*. Unpublished manuscript. Philadelphia, PA: Center for Cognitive Therapy.

Zika, S., & Chamberlain, K. (1992). On the relation between meaning in life and psychological well-being. *British Journal of Psychology*, *83*(1), 133-145. doi:10.1111/j.2044-8295.1992.tb02429.x