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Spiritual coping, perceived growth, and the moderating role of spiritual mindfulness in cancer survivors

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ABSTRACT

Purpose: This study examined the moderating role of spiritual mindfulness on the association between spiritual coping and perceived growth in individuals with and without current treatment for cancer. **Design/Sample:** Adults with a cancer history ($N = 534$) from the Midlife in the United States study completed a telephone interview and self-administered questionnaires. **Methods/Findings:** Moderated regression analyses, controlled for age and educational attainment, showed that mindfulness moderated the effect of spiritual coping on personal growth and on positive reinterpretation. High mindfulness amplified the effect of spiritual coping on both personal growth and positive reinterpretation. Further, this moderating effect was significantly different for adults with versus without current treatment for cancer for positive reinterpretation but not for personal growth. **Conclusions/Implications:** These findings highlight the potential amplifying effect of spiritual mindfulness on the effect of spiritual coping on perceived growth in cancer survivors.

KEYWORDS

cancer survivors; growth; mindfulness; moderation; religious or spiritual coping

The diagnosis of cancer as well as its treatments causes significant stress and poses threats to the affected individuals' psychological well-being. For instance, in a large U.S. sample of 4,496 individuals with cancer ranging from newly diagnosed individuals to individuals diagnosed four years or more ago, 35% were above the cut-off points of the Brief Symptom Inventory, indicating that they experienced serious psychological distress (Zabora, Brintzenhofesoc, Curbow, Hooker, & Piantadosi, 2001). A more recent study in Canada inquired 3,035 individuals with cancer on the day of their first appointment and found that more than 25% scored above the cut-off points for depression and anxiety on the Hospital Anxiety and Depression Scale (Sellick & Edwardson, 2007). Moreover, the level of stress is also elevated in cancer survivors after treatment termination. In a study with 4,903 participants, more than one in four reported high symptom burden approximately one year post-diagnosis (Shi et al., 2011).

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Yet, cancer can be viewed as a *psychosocial transition* (Andrykowski & Hunt, 1993; Andrykowski et al., 1996; Parkes, 1967) that can elicit both distress and personal growth. Parkes (1967) used *psychosocial transition* to refer to traumatic events that involve major life changes, are lasting, and that can challenge an individual's assumptions held about the world. Tedeschi and Calhoun (1995, 2004) coined the term *posttraumatic growth*, sometimes used interchangeably with *stress-related growth* or *benefit finding* (Affleck & Tennen, 1996; Park, Cohen, & Murch, 1996), to describe a process of personal transformation or positive life changes following a traumatic life event, such as cancer. The concepts of psychosocial transition and posttraumatic growth are consistent with *existential theory* (Spiegel & Classen, 2000) suggesting that a person who is confronted with his or her own mortality may elicit a reevaluation and redefinition of the personal life goals and priorities. Thus, the models of posttraumatic growth and existential theory may be particularly useful in explaining perceived growth or positive changes such as personal growth or positive reinterpretation after a cancer diagnosis.

Cancer is prevalent in developed countries. According to the National Cancer Institute (2017), an individual is considered a cancer survivor from the time of diagnosis through the remainder of life. The projected incidence of cancer survivorship is growing in the United States with estimates from 15.5 million in 2016 up to 20.3 million by 2026 (National Cancer Institute, 2017); therefore, understanding and improving survivors' psychological well-being during and after cancer treatment is crucial. As many cancer survivors live longer, they are at risk for potential adverse long-term effects, such as fatigue, depression, or anxiety that can affect their quality of life (Brown & Kroenke, 2009). The ability to find benefits or growth has found to be related to positive psychological outcomes in cancer survivors (Helgeson, Reynolds, & Tomich, 2006; Sawyer, Ayers, & Field, 2010; Wang et al., 2017). Therefore, positive reappraisal or reinterpretation and personal growth may be particularly relevant for exploring potential thriving after a cancer diagnosis.

People diagnosed with cancer frequently report using religious or spiritual coping (Harrison, Koenig, Hays, Eme-Akwari, & Pargament, 2001; Zaza, Sellick, & Hillier, 2005). More than two thirds (68.5%) of a representative U.S. sample of individuals with a history of cancer reported having prayed for their own health (Ross, Hall, Fairley, Taylor, & Howard, 2008). In another study with individuals with advanced cancer, 75% said they spent time in private religious activities at least once a month (Tarakeshwar et al., 2006). Individuals with cancer using religious coping rely primarily on positive religious coping, which is defined as a sense of love, compassion, and partnership with the divine (Pargament, Smith, Koenig, & Perez, 1998), and only use negative religious coping characterized by strain and an ominous view of the world, to a limited degree (Hebert, Zdaniuk, Schulz, & Scheier, 2009). Similarly, religious or spiritual coping also appears to be a promising predictor of greater perceived growth in cancer survivors. In a cross-sectional study with 230 women with early-stage breast cancer, Urcuyo, Boyers, Carver, and Antoni (2005) reported that greater use of positive religious coping was associated

with more benefit finding. In a study with 36 individuals with breast, colorectal, or prostate cancer, Kallay (2006) found that religious meaning making was associated with posttraumatic growth. Using a longitudinal design, Gall, Charbonneau, and Florack (2011) examined 87 women with breast cancer from pre-diagnosis up to 24 months post-surgery and found mixed associations among variables reflecting religious or spiritual coping and perceived growth. Greater use of benevolent reappraisal, religious focused and religious directional behavior at pre-diagnosis were related to higher levels of reported growth at post-surgery, whereas greater religious salience or involvement at pre-diagnosis was related to less growth at post-surgery. Thus, whether religious or spiritual coping predicts perceived growth over time seems to depend on the type of religious or spiritual coping studied.

Mindfulness has its roots in Eastern spirituality (Vandenberghe & Prado, 2009) and can be considered as an alternative resource for cancer survivors. Mindfulness can be described as paying purposeful non-judgmental attention to the present moment, and considering it with an attitude of affection, curiosity, and kindness (Kabat-Zinn, 2003). Garland, Farb, Goldin, and Fredrickson (2015) present a *mindfulness-to meaning theory* describing the mechanisms by which mindfulness may facilitate positive reappraisal and personal growth. They propose that mindfulness evokes a decentered mode of awareness in which stress appraisals are viewed from a metacognitive perspective providing space for greater perspective taking and subsequent positive reappraisal. The process of positive reappraisal involves broadening the scope of appraisal to appreciate that even aversive experiences are potential vehicles for personal transformation and growth. In addition to modulating the regulation of aversive experience, positive reappraisal results in positive emotions that may then be savored and ultimately lead to adaptive actions and a sense of meaningfulness or purpose in life. Further, Garland et al. (2010) have hypothesized that the repeated, intentional engagement of the metacognitive state underlying mindfulness can change brain activity, resulting in trait or dispositional mindfulness over time. Therefore, as dispositional mindfulness increases individuals are more likely to make positive reappraisal and experience personal growth in the face of distress. For instance, Garland et al. (2017) examined 97 individuals with cancer and found that individuals with higher levels of dispositional mindfulness were more likely to pay attention to positive experiences which in turn was associated with positive reappraisal of stressful life events.

Mind-body interventions in general (Rudaz, Ledermann, & Witt, 2017), and Mindfulness-Based Stress Reduction (MBSR; Kabat-Zinn, 2009) and Mindfulness-Based Cancer Recovery (MBCR; Carlson & Speca, 2011; Carlson et al., 2014) in particular, are programs whose effects have been studied in integrative oncology. Shiyko, Hallinan, and Naito (2017) conducted a meta-analysis to investigate the effects of those trainings on posttraumatic growth in individuals with medical trauma. The sample included 11 studies with a total of 1,195 participants of whom 98.6% had a cancer-related trauma. MBSR and MBCR were the most commonly evaluated trainings and the median length of interventions was 8 weeks with

weekly group sessions of approximately 2.5 to 3.5 hours. Overall, a small positive effect (Cohen's $d = 0.34$) was found for posttraumatic growth. Omid, Mohammadi, Jalaeikhoo, and Taghva (2017) examined posttraumatic growth and dispositional mindfulness in 109 individuals with cancer from Tehran. They found that some facets of mindfulness (i.e., observing, non-reactivity to inner experience, and describing) predicted posttraumatic growth. Other facets of mindfulness namely acting with awareness and non-judging of inner experience were unrelated to posttraumatic growth. There is also some evidence that spirituality is linked to dispositional mindfulness. For example, Carmody, Reed, Kristeller, and Merriam (2008) examined 44 participants of a self-paid MBSR program and found that increases in spiritual well-being were associated with increases in trait mindfulness after the training. However, to the best of our knowledge, the relationship between spiritual coping and mindfulness has not been studied so far.

Although several studies have investigated associations between religious or spiritual coping and mindfulness in perceived growth, more studies are needed to better understand the mechanisms that promote personal growth or finding benefit in cancer survivors (Gall, Charbonneau, & Florack, 2011; Helgeson, Reynolds, & Tomich, 2006). The present study aims to investigate the moderating role of spiritual mindfulness on the effect of spiritual coping on perceived growth in cancer survivors with or without current treatment, above and beyond age and level of education. On the basis of previous findings in cancer survivors (Kallay, 2006; Shiyko, Hallinan, & Naito, 2017; Urcuyo, Boyers, Carver, & Antoni, 2005), we hypothesized:

H1. Higher levels of spiritual coping and spiritual mindfulness are associated with greater personal growth and positive reinterpretation.

H2. High spiritual mindfulness enhances the association of spiritual coping with the outcomes personal growth and positive reinterpretation.

Method

Participants

This study used data from the second wave of the Midlife in the United States national study of health and well-being (MIDUS-II; Ryff et al., 2017). The MIDUS II is a follow-up study of MIDUS I from 1995 to 1996, where a sample of English-speaking adults aged 25 to 74 years were recruited via random digit dialing. Of the 7108 participants in MIDUS I, 4,963 participated in MIDUS II from 2004 to 2006 and completed both the telephone interview and self-administered questionnaires. In the present study, participants who responded affirmatively to the question "Have you ever had cancer?" in the telephone interview and with complete data for all study variables were selected for the analyses, resulting in a sample of 534 adults.

Procedure and measures

Spiritual coping

Spiritual or religious coping was measured by two self-report questions developed by the MIDUS authors, each with a 4-point response option ranging from “often” (1) to “never” (4). The first question was “When you have problems or difficulties in your family, work, or personal life, how often do you seek comfort through religious or spiritual means such as praying, meditating, attending a religious or spiritual service, or talking to a religious or spiritual advisor?” The second question was “When you have decisions to make in your daily life, how often do you ask yourself what your religious or spiritual beliefs suggest you should do?” The two items were reverse-coded and summed up so that higher scores indicated greater spiritual coping (Cronbach’s $\alpha = .86$). This scale has been used in another study as a measure of spiritual coping (Einolf, 2013).

Spiritual mindfulness

Spiritual mindfulness was measured by nine items developed by the MIDUS authors using the conceptualization of mindfulness by Langer and Moldoveanu (2000). These authors consider mindfulness as a process of drawing actively novel distinctions to what is noticed in the present moment. This process can lead to a number of diverse consequences, including (1) a greater sensitivity to one’s environment, (2) more openness to new information, (3) the creation of new categories for structuring perception, and (4) enhanced awareness of multiple perspectives in problem solving. In the MIDUS study, participants were asked to rate to what extent they agreed to each statement because of their religion or spirituality on a 5-point rating scale ranging from “strongly agree” (1) to “strongly disagree” (5). “Because of your religion or spirituality, do you try to be more engaged in the present moment,” “more sensitive to the feelings of others,” “more receptive to new ideas,” “a better listener,” “a more patient person,” “more aware of small changes in my environment,” “more tolerant of differences,” “more aware of different ways to solve problems,” and “more likely to perceive things in new ways.” All items were reverse-coded and summed up with higher scores indicating greater spiritual mindfulness (Cronbach’s $\alpha = .93$). This scale was used in other studies as a measure of spiritual mindfulness (Brisbon & Lachman, 2017; Imel & Dautovich, 2016; Sesker, Súilleabháin, Howard, & Hughes, 2016).

Personal growth

Personal growth was measured by seven items selected by the MIDUS authors from the original 20-item scale developed by Ryff (1989). The 20-item subscale showed high internal consistency (Cronbach’s $\alpha = .87$) and test-retest reliability of .81 as well as convergent and discriminant validity (Ryff, 1989). Participants were asked to indicate their level of agreement on a 7-point scale from “strongly agree” (1) to “strongly disagree” (7). The items were: “I am not interested in

activities that will expand my horizons,” “I think it is important to have new experiences that challenge how you think about yourself and the world (R),” “When I think about it, I haven’t really improved much as a person over the years,” “I have the sense that I have developed a lot as a person over time (R),” “For me, life has been a continuous process of learning, changing, and growth (R),” “I gave up trying to make big improvements or changes in my life a long time ago,” and “I do not enjoy being in new situations that require me to change my old familiar ways of doing things.” Items marked with (R) were reverse-coded and summed up with higher scores indicating greater personal growth (Cronbach’s $\alpha = .77$). These items have been used to measure personal growth in other studies (Archontaki, Lewis, & Bates, 2013; Curhan et al., 2014; Morozink, Friedman, Coe, & Ryff, 2010).

Positive reinterpretation

Positive reinterpretation was measured by the COPE Inventory Positive Reinterpretation and Growth Subscale developed by Carver, Scheier, and Weintraub (1989). Participants were asked to indicate what they usually do when they experience a stressful event on a 4-point rating scale ranging from “A lot” (1) to “Not at all” (4). The subscale consists of 4 items (e.g., “I try to see it in a different light, to make it seem more positive”). All items were reverse-coded and summed up with higher scores indicating greater positive reinterpretation and growth (Cronbach’s $\alpha = .80$). The subscale has shown adequate psychometric properties, with a Cronbach’s alpha of .68 and a test-retest reliability of .48, and evidence of discriminant and convergent validity (Carver, Scheier, & Weintraub, 1989).

Statistical analyses

Ordinary least squares (OLS) regression analysis and SPSS were used to assess the moderating role of spiritual mindfulness in cancer survivors. Two models were estimated both using spiritual coping as predictor for personal growth (model 1) and for positive reinterpretation (model 2). In addition, a binary group variable was included as second moderator to compare individuals receiving current treatment or therapy for cancer (coded 1) with individuals not receiving current treatment or therapy for cancer (coded -1). The continuous predictor and moderator variables were mean-centered prior to the analyses (Aiken, West, & Reno, 1991) and then multiplied to form the interaction terms. Analyses controlled for participants’ age and educational attainment because previous research suggest these demographic characteristics are sometimes associated with the outcomes of the current study (Carver & Antoni, 2004; Lechner et al., 2003; Sears, Stanton, & Danoff-Burg, 2003; Urcuyo, Boyers, Carver, & Antoni, 2005). Significant interactions were illustrated separately for individuals with or without current treatment for cancer.

Results

Preliminary analyses

The types of cancer reported by individuals with and without current treatment for cancer are given in Table 1. Among the 74 individuals with current treatment for cancer, 33 (44.6%) were male and 41 (55.4%) were female. Among the 460 individuals with no current treatment for cancer, 185 (40.2%) were male and 275 (59.8%) were female. In both groups, the most frequent types of cancer were skin/melanoma and prostate cancer for men and skin/melanoma and breast cancer for women.

Descriptive statistics are shown in Table 2. There were no significant differences on the study variables between the two groups using independent sample *t* tests. The product-moment correlation between spiritual coping and mindfulness was .46.

Main analyses

Personal growth

Support for the first hypothesis was mixed. The association of spiritual coping with personal growth was not significant (Table 3). However, as hypothesized, the association of mindfulness with personal growth was positive and statistically significant indicating that greater spiritual mindfulness was associated with greater personal growth. Further, consistent with the second hypothesis, the interaction effect for spiritual coping and spiritual mindfulness was also statistically significant, indicating that the effect of spiritual coping on personal growth was moderated by the level of spiritual mindfulness. Figure 1 illustrates the interaction effect between spiritual coping and personal growth for low spiritual mindfulness, defined as the mean minus one *SD* (i.e., -5.76), and high spiritual mindfulness, defined as the mean plus one *SD* (i.e., 5.76). In individuals with current treatment for cancer, personal growth was high if

Table 1. Type of cancer for the individuals with and without current treatment for cancer.

Type of cancer	Individuals with current treatment for cancer (<i>n</i> = 74)				Individuals without current treatment for cancer (<i>n</i> = 460)			
	Male (<i>n</i> = 33)		Female (<i>n</i> = 41)		Male (<i>n</i> = 185)		Female (<i>n</i> = 275)	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Prostate	12	36.4	—	—	54	29.2	—	—
Cervical	—	—	1	2.4	—	—	31	11.3
Ovarian	—	—	1	2.4	—	—	10	3.6
Uterine	—	—	0	0.0	—	—	21	7.6
Breast	0	0.0	20	48.8	0	0.0	71	25.8
Colon	2	6.1	1	2.4	18	9.7	12	4.4
Lung	0	0.0	0	0.0	3	1.6	7	2.5
Lymphoma or leukemia	3	9.1	3	7.3	5	2.7	8	2.9
Skin/melanoma	13	39.4	12	29.3	81	43.8	96	34.9
Other	8	24.2	7	17.1	35	18.9	41	14.9

Table 2. Means, standard deviations, and empirical ranges for the study variables for the individuals with and without current treatment for cancer.

Variable	Individuals with current treatment for cancer ($n = 74$)			Individuals without current treatment for cancer ($n = 460$)		
	<i>M</i>	<i>SD</i>	Range	<i>M</i>	<i>SD</i>	Range
Age	62.35	11.73	41–83	63.78	11.82	35–84
Highest level of education	7.20	2.86	2–12	7.07	2.62	1–12
Spiritual coping	6.07	2.00	2–8	5.85	2.09	2–8
Spiritual mindfulness	34.35	6.33	9–45	34.71	5.67	9–45
Personal growth	37.54	7.24	17–49	38.04	7.21	15–49
Positive reinterpretation and growth	12.33	2.29	7–16	12.15	2.41	4–16

Note. *M* = Mean, *SD* = Standard deviation. Possible ranges: 1–12 for highest level of education (1 = no school/some grade school, 12 = PhD, MD, or other professional degree), 2–8 for spiritual coping, 9–45 for spiritual mindfulness, 7–49 for personal growth, 4–16 for positive reinterpretation and growth.

both spiritual coping and mindfulness were high. Personal growth was low in individuals reporting high spiritual coping and low mindfulness. In the individuals with no current treatment for cancer, personal growth was high if both spiritual coping and mindfulness were high. It was low in individuals reporting high spiritual coping and low mindfulness. Both control variables were statistically significant, revealing that the younger the individual and the higher the level of completed education the higher the personal growth. The total explained variance was 17% and the variance explained by the interaction effects above and beyond the simple effects was 2.8%, $F(4, 524) = 4.36, p < .01$.

Positive reinterpretation

Again, support for the study hypotheses was mixed. Spiritual coping was not associated with positive reinterpretation (Table 3). However, as hypothesized, the

Table 3. Regression analyses for individuals with a cancer history ($N = 534$).

Predictor	Personal growth		Positive reinterpretation	
	<i>b</i>	<i>SE</i>	<i>b</i>	<i>SE</i>
Age	−0.05*	0.02	0.00	0.01
Education	0.62***	0.11	0.04	0.04
Spiritual coping	0.21	0.24	0.08	0.08
Spiritual mindfulness	0.35***	0.08	0.16***	0.03
Group ^a	−0.70	0.47	−0.07	0.15
Coping x Mindfulness	0.12***	0.03	0.05***	0.01
Coping x Group	0.22	0.24	0.10	0.08
Mindfulness x Group	−0.11	0.08	−0.05	0.03
Coping x Mindfulness x Group	0.06	0.03	0.02*	0.01
Intercept	35.76***	1.84	11.91***	0.60
R^2	0.17		0.19	
$F(9, 524)$	11.72***		13.77***	

Note. Spiritual coping and spiritual mindfulness were mean-centered prior to the analyses.

^a1 = currently using any type of treatment for cancer, −1 = currently not using any type of treatment for cancer.

* $p < .05$. ** $p < .01$. *** $p < .001$ (2-tailed).

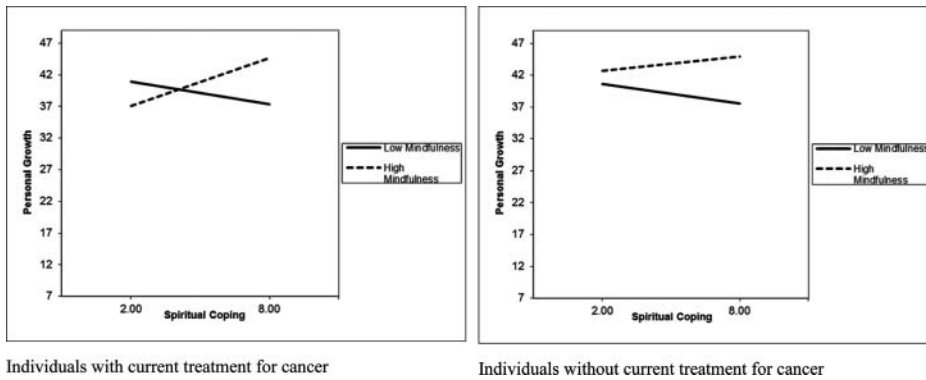


Figure 1. Regression lines of the individuals with and without current treatment for cancer showing the moderating effect of spiritual mindfulness on the relationship between spiritual coping and personal growth.

association of spiritual mindfulness with positive reinterpretation was positive and statistically significant. Further, the two interaction effects Spiritual Coping X Mindfulness and Spiritual Coping X Mindfulness X Group, emerged statistically significant, indicating that the association between spiritual coping and positive reinterpretation was moderated by the level of spiritual mindfulness and that this moderating effect was significantly different between the individuals with and without current treatment or therapy for cancer. Figure 2 illustrates the relationship between spiritual coping and positive reinterpretation for low spiritual mindfulness, defined as the mean minus one *SD* (i.e., -5.76), and high spiritual mindfulness, defined as the mean plus one *SD* (i.e., 5.76). In individuals with current treatment for cancer, positive reinterpretation was high if both spiritual coping and mindfulness were high and low if spiritual coping was low and mindfulness was high. Positive reinterpretation was also high in individuals reporting low spiritual coping and low mindfulness and low in individuals reporting high spiritual coping and low mindfulness. In the individuals with no current treatment for cancer, positive reinterpretation was high if both spiritual coping and mindfulness were high. Positive reinterpretation was low if spiritual coping was high and mindfulness was low. None of the control variables were statistically significant. The total explained variance was 19% and the additional variance explained by the interaction effects was 3.9%, $F(4, 524) = 6.25, p < .001$.

Additional analyses

We have also included gender (1 = male, -1 = female) as additional moderating variable because of previous research findings (Curbow, Somerfield, Baker, Wingard, & Legro, 1993; Klauer, Ferring, & Filipp, 1998). The pattern of result remained the same for positive reinterpretation and for personal growth with the exception that the covariate age was no longer statistically significant.

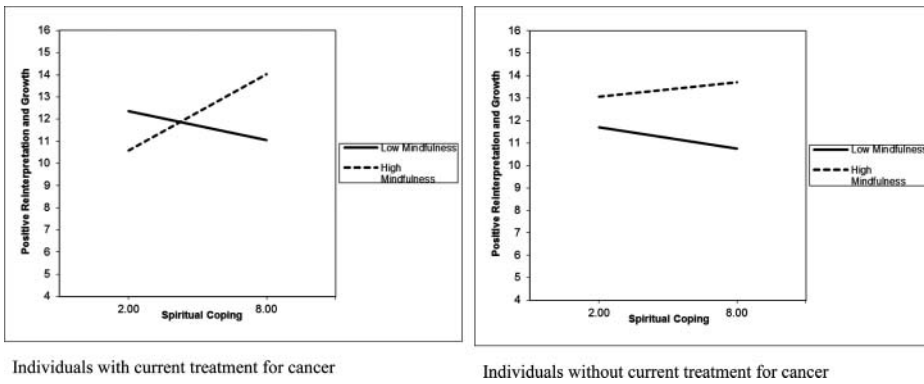


Figure 2. Regression lines of the individuals with and without current treatment for cancer showing the moderating effect of spiritual mindfulness on the relationship between spiritual coping and positive reinterpretation.

Discussion

This study examined the mechanism by which spiritual mindfulness modifies the effect of spiritual coping on perceived growth in individuals with and without current treatment for cancer, above and beyond individuals' age and education. Evidence indicates that spiritual mindfulness moderated the effect of spiritual coping on both personal growth and positive reinterpretation. However, the mechanism by which mindfulness did so was different for individuals with current versus those with historical treatment for positive reinterpretation. Specifically, in individuals without current treatment, the relationship between spiritual coping and positive reinterpretation was enhanced by a high level of mindfulness. In individuals with current treatment, positive reinterpretation was high in individuals reporting both high spiritual coping and high mindfulness and it was low if either spiritual coping was low combined with high mindfulness or spiritual coping was high combined with low mindfulness. A possible explanation for the different moderating effect of spiritual mindfulness on positive reinterpretation in the two groups might be that at a time of great vulnerability, as for individuals undergoing treatment, high engagement in both spiritual coping and mindfulness may produce more comfort (versus cognitive dissonance; Festinger, 1962) and therefore generate more likely positive reinterpretation.

For personal growth, individuals with current cancer treatment did not significantly differ from those with historical treatment, though the pattern was very similar to the one found for positive reinterpretation. In both groups, high mindfulness and high spiritual coping seems to be associated with high personal growth, whereas high spiritual coping combined with low mindfulness seems to be associated with low personal growth.

The finding that mindfulness can strengthen perceived growth in individuals with cancer is in line with other studies (Shiyko, Hallinan, & Naito, 2017). In contrast to other studies (Kallay, 2006; Urcuyo, Boyers, Carver, & Antoni, 2005), spiritual coping did not predict perceived growth after controlling for level of

mindfulness, the interaction between them, age, and educational attainment. In addition, younger age and higher education were found to be associated with increased personal growth corroborating findings by Lechner et al. (2003) and Sears, Stanton, and Danoff-Burg (2003), but not with positive reinterpretation.

The findings of this study reveal practical implications in the use of spiritual mindfulness as an effective way of coping for cancer survivors. In particular, for cancer survivors with high spiritual coping and low mindfulness there seems to be potential for the introduction of mindfulness trainings in order to strengthen perceived growth. However, this warrants further investigation with longitudinal designs and various stages of cancer treatment.

The findings of this study add to the literature on cancer survivorship by shedding light into the mechanism by which spiritual coping and mindfulness affect perceived growth across different types of cancer (Lechner et al., 2003; Ross et al., 2008). Major strengths of the present study include the large sample size of 534 individuals with a cancer history drawn from a nationally representative U.S. sample and a broad age range from 35 to 84 years. There are also some limitations noteworthy. First, MIDUS is a national survey of aging and some cancer-related information (e.g., disease stage, treatment recurrence) were not available and could be taken into account in further studies. Also, information is lacking on participants with breast or prostate cancer who are on long-term hormonal therapies, which fall into the group of current treatment although the main treatment is completed. Second, our sample consisted of individuals with different types of cancer and therefore the results presented might not generalize to all types of cancer, but samples sizes would be too small taking different types of cancer diagnosis into consideration. Third, the scale used to measure mindfulness assesses spiritual mindfulness. Further research may focus on trait mindfulness using a measure such as the Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003), which is untied to religion or spirituality. Fourth, all measures were self-reported, rather than based on physician diagnosis or family report. Finally, there is a possibility of selection bias since cancer survivors who participate in a time-consuming research study may be those who are doing particularly well.

In conclusion, the current study showed that spiritual mindfulness can enhance the effect of spiritual coping on personal growth and positive reinterpretation in cancer survivors, above and beyond age and education. Further, the findings highlight that the moderating effect was different for individuals with versus without current treatment for positive reinterpretation but not for personal growth. Yet, for both individuals with current treatment and those without, being high on spiritual coping and low on mindfulness seem to be associated with low perceived growth, whereas individuals reporting both high spiritual coping and mindfulness also report high perceived growth. Given the fact, that many people diagnosed with cancer turn to religious or spiritual coping, this study highlights the beneficial effect of spiritual mindfulness on perceived growth during and after cancer treatment and therefore may help cancer survivors to live a satisfied and fulfilled life.

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