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# Role of Spirituality on the Association Between Depression and Quality of Life in Stroke Survivor–Care Partner Dyads

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## Abstract

### Background:

Little is known about the protective effect of spirituality on the association between known risk factors such as depression and quality of life (QOL) in stroke survivor-care partner dyads. Therefore, the aim of this study was to evaluate the moderating role of spirituality on the association between depressive symptomatology and QOL in stroke survivor–care partner dyads.

### Methods and Results:

Longitudinal design with 223 stroke survivor–care partner dyads enrolled at survivor discharge from rehabilitation hospitals. Data collection was performed over 12 months. We measured survivors' and care partners' depression, quality of life, and spirituality. Examining the moderating role of spirituality on the association between depressive symptoms and QOL within survivor-care partner dyads, we used a traditional Actor-Partner-Interdependence Model and a basic Actor-Partner-Interdependence Model moderation model for a mixed variable. Survivors (51% male) and care partners (66% female) were 70.7 and 52.3 years old, respectively. The survivor's spirituality significantly moderated the association between care partner depressive symptomatology and survivor psychological QOL ( $B=0.03$ ,  $P<0.05$ ) and moderated the association between care partner depressive symptoms and care partner physical ( $B=0.05$ ,

$P < 0.001$ ) and psychological ( $B = 0.04$ ,  $P < 0.001$ ) QOL. The care partner's own level of spirituality was significantly positively associated with their physical QOL ( $B = 0.28$ ,  $P < 0.001$ ).

## Conclusions:

The findings from this study have broad implications for the role of spirituality in relation to QOL in medical-health contexts and the importance of examining such concepts within a dyadic framework. Greater awareness of the importance of spirituality among clinicians and nurses may improve cultural competence in healthcare services.

### What Is Known

- Both stroke survivors and care partners have been found to experience high levels of depressive symptomatology.
- Depressive symptomatology is an important comorbidity, which requires careful management for stroke survivors and care partners because of its severe impact on quality of life.

### What the Study Adds

- The survivor's spirituality significantly moderated the association between care partner depressive symptomatology and survivor psychological quality of life.
- The survivor's spirituality significantly moderated the association between care partner depressive symptoms and care partner physical and psychological quality of life.
- The care partner's own level of spirituality was significantly positively associated with their physical quality of life.

## Introduction

Stroke is a chronic condition, which affects millions of people worldwide in industrialized countries,<sup>1,2</sup> with high prevalence, estimated between 1.9% and 4.5%<sup>2</sup> in the United States and between 1.5% and 3.0% in Europe<sup>1</sup> among people aged  $\geq 20$  years. Aging and unhealthy lifestyles are the main causes of increased stroke prevalence and incidence.<sup>2</sup> Indeed, stroke incidence and prevalence are projected to increase in the future, especially among female older adults.<sup>3</sup>

Given the severe disabilities and limitations in activities of daily living present in those who experience stroke,<sup>4</sup> both stroke survivors<sup>5</sup> and care partners<sup>6</sup> (eg, a family member or friend who assumes primary responsibility for assisting a chronically impaired individual, with the management of their health) have been found to experience high levels of depressive symptomatology. Indeed, post-stroke,  $\approx 30\%$  of stroke survivors experience high-depressive

symptomatology<sup>7</sup> associated with physical/psychological disabilities,<sup>8</sup> social exclusion,<sup>9</sup> lower physical functioning,<sup>10</sup> poor rehabilitation outcomes,<sup>11</sup> and increased mortality rate.<sup>12</sup> Stroke care partners are also at risk for depression with some studies reporting up to 52% of them experiencing depressive symptomatology during the caregiving period.<sup>5</sup> Care partners' higher depressive symptomatology has been associated with higher care partner burden levels<sup>13</sup> and length of caregiving.<sup>14</sup>

Depressive symptomatology is an important comorbidity, which requires careful management for stroke survivors and care partners because of its severe impact on quality of life (QOL).<sup>15</sup> However, although several recent studies<sup>5,15,16</sup> have highlighted that higher depressive symptomatology in stroke survivors and care partners are associated with both stroke survivors' and care partners' lower QOL, no studies have identified potential moderators of this association in stroke dyads. As defined by Baron and Kenny,<sup>17</sup> moderators are variables which "affect the direction and/or strength of the relation between an independent or predictor variable and a dependent or criterion variable".<sup>17</sup> They are, therefore, often seen as potential protective/risk factors as they increase/decrease the strength of associations. Spirituality has been associated with greater levels of hope, providing meaning and an important coping mechanism across illness contexts.<sup>18–20</sup> The World Health Organization (WHO) defines spirituality as an "individual's perception of life within the context of the culture and value systems of the society and in relation to the individual's goals, expectations, standards, and concerns."<sup>21</sup> Indeed, spirituality has been found to be a resource for coping with disabilities for both survivors<sup>22</sup> and care partners.<sup>23</sup> In the context of disability management, spirituality has been found to support people in coping with the uncertainties of a life with disability,<sup>19</sup> particularly related to personal identity and purpose of life.

Previous research has shown the protective nature of higher levels of spirituality for positive outcomes for both stroke survivors and care partners, including better QOL for both stroke survivors and care partners,<sup>24</sup> higher physical functioning for stroke survivors,<sup>25</sup> better health behaviors,<sup>26</sup> lower care partner burden,<sup>24</sup> and lower care partner depression and anxiety.<sup>27</sup> Yet, despite the important, protective role spirituality plays for the stroke dyad, no known studies have examined the moderating role of spirituality on the association of depressive symptomatology and outcomes in stroke.

However, spirituality has been found to play an important moderating role in other populations. For example, Bamonti et al<sup>28</sup> observed that spirituality moderated the association between depressive symptomatology and meaning in life in older adults seeking mental health treatment. Specifically, authors observed that when adults reported higher depressive symptomatology and lower spirituality, they reported the lowest meaning in life; when they reported higher depressive symptomatology and higher spirituality, they reported significantly greater meaning in life. In another study conducted on Malaysian adolescent students, authors<sup>29</sup> observed that those students who had higher levels of depressive symptomatology and hopelessness but also high spirituality had significantly less suicidal behaviors than those with low spirituality. Thus, spirituality is a potentially important, protective factor that warrants further examination in illness contexts such as stroke and particularly in cultures where spirituality may have a great impact on survivors' healthcare decisions<sup>30</sup> (eg, those perceived to be related to life and death), such as southern European,<sup>31</sup> Latino,<sup>32</sup> or African countries.<sup>33</sup> For example, research has demonstrated

that spirituality drove certain care-seeking behaviors, from end-of-life care<sup>34</sup> to contraception uses.<sup>35</sup>

Theoretically, several authors<sup>36,37</sup> have conceptualized spirituality as a coping variable which could moderate the effect of psychological variables (ie, depression) on individual variables (ie, QOL). Being a coping variable, spirituality could (1) alter the meaning of the events, making them less stressful in nature, (2) moderate the negative associations leading to problems, or (3) manage the level of emotional response to stressors.<sup>38</sup> Indeed, spirituality may influence not only the interpretation of life events but also the selection of strategies for understanding and managing the negative events of their own life,<sup>39</sup> such as a stroke, or may moderate the negative effects of stress and help individuals to reduce the impact of stressors.<sup>40</sup> In addition, in another study,<sup>41</sup> spirituality has been found to be a moderator between daily stress and health. This means that spirituality could help to mitigate the adverse effect of stress that could contribute to poor health and clearly indicates that spirituality is a “potential moderator of the related variables which should be encouraged and practiced by managerial personnel” (page 350).<sup>41</sup>

Despite awareness that depression affects both stroke survivors' and care partners' QOL, and despite the importance of studying both survivors and care partners simultaneously, through a dyadic approach, as described by Lyons and Lee,<sup>42</sup> little is known about the moderating effect of spirituality between depression and QOL in stroke survivor-care partner dyads. This gap represents a barrier to clinicians' ability to identify which stroke survivors and care partners may be more at risk for poor outcomes, and the researchers' ability to appropriately conceptualize and develop holistic and effective interventions that may improve the dyadic QOL in culturally sensitive ways. Within a dyadic approach, there is added benefit to examining the transactional nature of the influence of spirituality within the stroke dyad (ie, how does the spirituality of the survivor influence the care partner and vice versa). For instance, the actor effect of one's own spirituality versus the partner effect of one's partner's spirituality.<sup>43</sup>

Therefore, the aim of this study was to evaluate the moderating role of spirituality on the association between depressive symptomatology and QOL in stroke survivor–care partner dyads.

## Materials and Methods

The authors declare that all supporting data are available within the article.

### Design

The current, longitudinal study recruited stroke survivor-care partner dyads at discharge from several rehabilitation hospitals located in central-southern Italy and followed up with them every 3 months over a 1-year period. To conduct this study, we used data from a larger longitudinal project aimed to analyze the quality of life in stroke survivor-care partner dyads at discharge from rehabilitation hospital and at 3, 6, 9, and 12 months post-discharge, analyzing how QOL changes over time by looking at the effect of the preexisting situation before stroke, and any moderation caused by environmental and stroke survivor–related and care partner–related variables.

### Participants and Procedures

Stroke survivors and their care partners were enrolled from 10 rehabilitation hospitals across Italy at the point of discharge. Eligibility criteria included a diagnosis of stroke confirmed by

tomography or magnetic resonance and willingness to participate in the study and provide written informed consent. Care partners were considered eligible if they were identified by the stroke survivor as the person who provided them with most of their informal care. Survivors with preexisting physical and cognitive impairment, cancer, or severe organ failure (eg, chronic renal failure) were excluded. A total of 414 stroke survivors were enrolled in this study but only 244 had a care partner willing to participate. Of these 244, 213 stroke-survivor-care partner dyads had complete data on the variables of interest. The focus of the current study was on the role of spirituality. We did not have any specific inclusion criteria regarding religious affiliation nor did we ask participants for their religious affiliation. However, since participants were recruited in a predominantly Catholic country, we think it is likely that most participants were Catholic. All participants were informed about the study protocol and provided a signed consent form. The Institutional Review Board of each rehabilitation hospital where participants were enrolled approved the study.

## Measures

A battery of psychometrically sound instruments was used to collect stroke survivor and care partner data but, for the aim of this study, we considered the following instruments that were administered both to stroke survivors and care partners. Survivors and care partner QOL was measured using the 26-item WHOQOL-BRIEF (World Health Organization Quality of life-BRIEF)<sup>44</sup> instrument that measures the dimensions of physical, psychological, social and environmental QOL. Each dimension has a possible score from 0 to 100, with higher scores indicating better QOL. The WHOQOL-BRIEF was tested for validity and reliability in several patient and care partner populations.<sup>45,46</sup> Stroke survivors' and care partners' depression was measured using the Hospital Anxiety and Depression Scale,<sup>47</sup> a 14-item questionnaire that measures anxiety (7 items) and depression (7 items) with a possible score range from 0 to 21 for each subscale. Higher scores correspond to higher levels of anxiety and depression. The Hospital Anxiety and Depression Scale has been used in stroke population<sup>48</sup> showing adequate validity and reliability.<sup>49</sup> Stroke survivors' and care partners' spirituality was analyzed using the WHOQOL-SRPB,<sup>21</sup> a 32-item instrument that measures spirituality through 8 dimensions: spiritual connection, meaning in life, awe, wholeness and integration, spiritual strength, inner peace, hope and optimism, and faith. Each WHOQOL-SRPB dimension has a score from 0 to 100 as does the total score, where a higher score indicates a higher spirituality level. The WHOQOL-SRPB has demonstrated good validity and reliability.<sup>50,51</sup>

Baseline data collection also included stroke survivors and care partner socio-demographic characteristics, such as age, sex, educational status and stroke survivor-care partner relationship, site and type of stroke and patient comorbidities.

## Statistical Analysis

Descriptive statistics were used to characterize the sample (SPSS v22; IBM Corporation, Armonk, NY). Multilevel modeling (Hierarchical Linear Modeling v7; Skokie, IL) was used to analyze data to control for interdependencies between survivor and care partner data and the autocorrelation among repeated measurements. Examining the moderating role of spirituality on the association between depressive symptoms and QOL within survivor-care partner dyads extends a traditional Actor-Partner-Interdependence Model (APIM) to a basic APIM moderation model for a mixed variable (ie, a variable that varies both within and between dyads, in this case



spirituality).<sup>43</sup> APIM is a statistical approach that allows for the simultaneous examination of survivor and care partner outcomes, controlling for the interdependent nature of the data (ie, interdependence in the model). Additionally, the APIM approach is considered advantageous for dyadic research as it allows for the simultaneous examination of both actor (ie, a survivor variable predicting a survivor outcome or a care partner variable predicting a care partner outcome) and partner (ie, a survivor variable predicting a care partner outcome or a care partner variable predicting a survivor outcome) effects. It is these partner effects (controlling for the actor effects) that uncover the transactional nature of the care dyad (ie, how they influence one another). The advantages of APIM approaches for dyadic data have been described comprehensively.<sup>52</sup>

To examine spirituality as both an actor and partner moderator, we tested 2 longitudinal models (1 for physical QOL and 1 for psychological QOL). Per APIM moderation,<sup>43</sup> each model included 4 interaction terms that represented the actor moderation for survivor (ie, survivor depressive symptoms × survivor spirituality) and care partner (ie, care partner depressive symptoms × care partner spirituality) and the partner moderation for survivor (ie, survivor depressive symptoms × care partner spirituality) and care partner (ie, care partner depressive symptoms × survivor spirituality). Each model controlled for main effects. Adjusted models were also run to determine if significant findings remained when controlling for known covariates of QOL (ie, survivor age, physical function, sex, educational status, stroke site, stroke type, care partner educational status and type of dyad (eg, spouse versus nonspouse)). No differences were found in adjusted models, so simpler unadjusted models are presented. Effect sizes for significant interactions were calculated using the formula  $r = \sqrt{t^2 / (t^2 + df)}$ . All predictors, moderators, and covariates were assessed at baseline only.

## Results

The mean age of stroke survivors was 70.7 (SD=±12.03) years old, with almost equal numbers of women (49%) to men (Table 1). Less than half of the survivors (39%) had a hemorrhagic (versus ischemic) stroke involving the right hemisphere (50%) and a minority were employed (17%) and had obtained more than a middle school education (31%). In addition, the time from stroke before rehabilitation discharge was mean 43 days (SD=±9.5). The mean age of care partners was 52.33 (SD=±13.19) years old, were predominantly women (66%) and in receipt of more than a middle school education (57%). The majority of care partners co-habited with stroke survivors (63%). Just less than half of care partners were employed (48%) and spouses of the stroke survivor (36%). The nonspouse care partners related to the stroke survivor were son/daughter (50%), brother or sister (4.5%), and friends (9.5%). Mean survivor and care partner depressive symptoms at baseline were 9.49 (SD=±4.25) and 7.18 (SD=±4.09), respectively. Survivor spirituality was 43.82 (SD=±15.83) and care partner spirituality was 45.69 (SD=±12.74).

**Table 1. Survivors' and Care Partners' Sociodemographic Characteristics (n=213)**

Characteristic	Patients	Care Partner
Age, y; mean±SD	70.7 (±12.0)	52.3 (±13.9)

Characteristic	Patients	Care Partner
Female, n (%)	104 (49)	140 (66)
Employed, n (%)	36 (17)	102 (48)
More than middle school, n (%)	66 (31)	121 (57)
Stroke type (ischemic), n (%)	130 (61)	...
Stroke site (right hemisphere), n (%)	106 (50)	...
Spouse care partner, n (%)	...	77 (36)
Care partner living with stroke survivor, n (%)		135 (63)
Patient comorbidities, mean ( $\pm$ SD)	0.89 ( $\pm$ 1.1)	...
Patient memory/cognition, mean ( $\pm$ SD)	70.8 ( $\pm$ 24.5)	...
Time in days for stroke, mean ( $\pm$ SD)*	43.4 ( $\pm$ 9.5)	...
Depression, mean ( $\pm$ SD)	9.4 ( $\pm$ 4.2)	7.1 ( $\pm$ 4.0)
Spirituality, mean ( $\pm$ SD)	43.8 ( $\pm$ 15.8)	45.6 ( $\pm$ 12.7)
*Time in days from stroke before stroke survivors' discharge.		

## Physical and Psychological QOL in Stroke Dyads

As reported elsewhere,<sup>15</sup> survivors and their care partners reported moderate levels of physical QOL (50.05 [SE=1.11] versus 67.21 [SE=1.04], respectively) and psychological QOL (50.77 [SE=1.10] versus 62.68 [SE=1.00], respectively) at baseline, with both physical ( $\tau=0.17$ ) and psychological ( $\tau=0.45$ ) QOL covarying within dyads. Survivor physical QOL improved significantly over time (1.46 [SE=0.41];  $P<0.001$ ), whereas care partner physical QOL remained flat (0.53 [SE=0.32];  $P>0.05$ ). Similarly, survivor psychological QOL improved significantly over time (0.85 [SE=0.38];  $P<0.05$ ), whereas care partner psychological QOL remained flat (0.004 [SE=0.30];  $P>0.05$ ).

## The Moderating Role of Spirituality on Physical QOL

Table 2 shows the moderating role of spirituality on the association between depressive symptom scores and physical and psychological QOL. In the case of physical QOL, there were no actor or partner moderating effects of spirituality for survivor, but there was a significant partner moderator effect for care partner physical QOL at baseline ( $B=0.05$ ,  $P<0.001$ ); namely a significant interaction between care partner depressive symptoms and survivor spirituality (effect

size=0.24). As can be seen in **Figure 1**, survivor spirituality significantly moderated the association between care partner depressive symptoms and care partner physical QOL at baseline. In other words, in care partners caring for survivors with high levels of spirituality, the association between high depressive symptoms and worse physical QOL was weaker than in care partners caring for survivors with low levels of spirituality. Additionally, care partner spirituality was significantly positively associated with baseline care partner physical QOL ( $B=0.28$ ;  $P<0.001$ ). There were no significant effects of spirituality for changes in QOL.

**Table 2. Moderating Role of Spirituality on Association Between Depressive Symptoms and QOL Over Time (N=213)**

	Physical QOL		Psychological QOL	
	Survivor	Care Partner	Survivor	Care Partner
	Parameter Estimate (SE)	Parameter Estimate (SE)	Parameter Estimate (SE)	Parameter Estimate (SE)
Intercept*	48.90 (0.97)†	67.06 (0.98)†	51.37 (0.84)†	62.91 (0.82)†
Survivor depressive sx	-2.12 (0.24)†	-0.31 (0.24)	-1.92 (0.21)†	-0.48 (0.21)‡
Care partner depressive sx	-0.33 (0.24)	-1.44 (0.24)†	-0.24 (0.21)	-1.82 (0.20)†
Survivor spirituality	0.10 (0.07)	-0.01 (0.07)	0.28 (0.06)†	0.03 (0.06)
Care partner spirituality	-0.01 (0.08)	0.28 (0.08)†	0.01 (0.07)	0.26 (0.07)†
Survivor depressive sx–survivor spirituality	-0.02 (0.01)	-0.01 (0.01)	0.01 (0.01)	-0.003 (0.01)
Survivor depressive sx–care partner spirituality	0.003 (0.02)	0.004 (0.02)	0.01 (0.02)	0.02 (0.02)
Care partner depressive sx–care partner spirituality	-0.03 (0.02)	-0.02 (0.02)	0.01 (0.02)	-0.01 (0.02)
Care partner depressive sx–survivor spirituality	0.01 (0.01)	0.05 (0.02)†	0.03 (0.01)‡	0.04 (0.01)†
Linear slope <sup>  </sup>	1.84 (0.45)†	0.53 (0.36)	0.99 (0.41)‡	-0.19 (0.35)
Survivor depressive sx	0.28 (0.11)‡	-0.00 (0.09)	0.16 (0.10)	0.02 (0.08)
Care partner depressive sx	-0.05 (0.11)	0.07 (0.09)	-0.13 (0.10)	0.12 (0.09)



	Physical QOL		Psychological QOL	
	Survivor	Care Partner	Survivor	Care Partner
	Parameter Estimate (SE)	Parameter Estimate (SE)	Parameter Estimate (SE)	Parameter Estimate (SE)
Survivor spirituality	0.002 (0.03)	-0.001 (0.02)	0.003 (0.03)	0.03 (0.02)
Care partner spirituality	0.03 (0.04)	-0.05 (0.03)	-0.04 (0.04)	-0.04 (0.03)
Survivor depressive sx–survivor spirituality	0.01 (0.01)	0.001 (0.01)	0.01 (0.01)	-0.002 (0.01)
Survivor depressive sx–care partner spirituality	0.01 (0.01)	0.01 (0.01)	0.004 (0.01)	0.004 (0.01)
Care partner depressive sx–care partner spirituality	0.01 (0.01)	-0.004 (0.01)	-0.001 (0.01)	-0.01 (0.01)
Care partner depressive sx–survivor spirituality	-0.002 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.004 (0.01)

QOL indicates quality of life; and sx, symptoms.

\*The intercept has been coded to represent baseline QOL.

† $P < 0.001$ .

‡ $P < 0.05$ .

||The linear slope represents rate of change per 3 mo in QOL over 12 mo. Interactions remained significant when adjusted for survivor age, physical function, sex, educational status, stroke site, stroke type, care partner, and type of dyad (eg, spouse vs nonspouse). Depressive symptoms and spirituality were centered around their mean.



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**Figure 1. Moderating effect of survivor (SVR) spirituality at baseline on the association of care partner (CP) depressive symptoms (Sx) at baseline and care partner physical quality of life (QOL) at baseline.** High and low levels of SVR spirituality and CP depressive symptoms represent 1 SD above and below the mean based on estimated effects shown in [Table 2](#).

## The Moderating Role of Spirituality on Psychological QOL

In the case of psychological QOL, there was a significant actor moderating effect of spirituality on survivor psychological QOL at baseline ( $B=0.03$ ,  $P<0.05$ ); namely a significant interaction between care partner depressive symptoms and survivor spirituality (effect size=0.16). As can be seen in [Figure 2](#), survivors being cared for by someone with higher levels of depressive symptoms had greater levels of psychological QOL when they themselves had high levels of spirituality versus survivors who had low levels of spirituality. Additionally, there was a significant partner moderating effect of spirituality on care partner psychological QOL at baseline ( $B=0.04$ ,  $P<0.001$ ); namely a significant interaction between care partner depressive symptoms and survivor spirituality (effect size=0.24). As can be seen in [Figure 3](#), care partners with high levels of depressive symptoms had better psychological QOL when the survivor they were caring for reported higher levels of spirituality. In this model, care partner spirituality was also significantly positively associated with care partner psychological QOL at baseline ( $B=0.26$ ,  $P<0.001$ ). There were no significant moderating effects on change in QOL.



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**Figure 2. Moderating effect of survivor (SVR) spirituality at baseline on the association of care partner (CP) depressive symptoms (Sx) at baseline and survivor psychological quality of life (QOL) at baseline.** High and low levels of SVR spirituality and CP depressive symptoms represent 1 SD above and below the mean based on estimated effects shown in [Table 2](#).



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**Figure 3. Moderating effect of survivor (SVR) spirituality at baseline on the association of care partner (CP) depressive symptoms (Sx) at baseline and care partner psychological quality of life (QOL) at baseline.** High and low levels of SVR spirituality and CP depressive symptoms represent 1 SD above and below the mean based on estimated effects shown in [Table 2](#).

## Discussion

The goal of this study was to evaluate the moderating role of spirituality on the association between depressive symptomatology and QOL in stroke survivor–care partner dyads. Our analysis clearly showed that (1) the survivor’s spirituality significantly moderated the association between care partner depressive symptoms and care partner physical QOL; (2) the care

partner's own level of spirituality was significantly positively associated with their physical QOL; (3) the survivor's spirituality significantly moderated the association between care partner depressive symptoms and survivor psychological QOL; (4) the survivor's spirituality significantly moderated the association between care partner depressive symptoms and care partner psychological QOL; and (5) the care partner's own level of spirituality was significantly positively associated with their psychological QOL. Despite evidence from other illness contexts<sup>18–20</sup> that spirituality can play an important role for some patients' adaptation and coping, few empirical studies have examined this potentially beneficial concept during the process of stroke recovery. Indeed, although prior studies have examined the effects of spirituality on individual outcomes, such as stroke survivors' physical functioning,<sup>53</sup> or care partners' burden,<sup>24</sup> spirituality still remains a novel, understudied concept in stroke research. Thus, our findings not only contribute greatly to this emerging area and our understanding of the role of spirituality in stroke recovery, but this is also the first known study to examine the role of spirituality within care dyads using a dyadic approach. This unique approach to spirituality represents an important advancement in the field of stroke (and beyond stroke) because it illuminates the complex interactions among depressive symptoms, QOL, and spirituality within stroke survivor-care partner dyads and the salient, interpersonal role spirituality plays in promoting positive outcomes for both members of the stroke care dyad.

Consistent with previous research,<sup>54–58</sup> our study found spirituality played a positive role for both survivors and care partners. Indeed, greater spirituality played a significant role in ameliorating the association between greater depressive symptoms and poor QOL for both survivor and care partner psychological QOL and care partner physical QOL. As stated earlier, in according with literature,<sup>5–7</sup> both stroke survivors and care partners experience high depressive symptoms, with negative impact on the QOL of the stroke dyad.<sup>15</sup> Yet, our study found that when survivors reported high levels of spirituality, it mitigated the negative impact of the care partner's depressive symptoms on the psychological QOL of both the survivor and care partner. In other words, when care partners reported higher levels of depressive symptoms, something that often places the health of the dyad and quality of care provided at risk,<sup>59,60</sup> the survivor's spirituality played a protective role for the dyad's psychological QOL and the care partner's physical QOL. The survivor's spirituality, not the care partner's spirituality, is a protective factor for both members of the dyad. It may well be that even when the care partner feels the emotional weight of the situation, but the survivor has a strong sense of spirituality (operationalized in this study as a sense of purpose, hope, optimism, faith, the strength to go forward, and a sense of peace) that this has an important beneficial effect on both the survivor themselves but also their care partner experiencing depressive symptoms. Care partners may see greater rewards to providing care when the survivor has greater levels of spirituality. Across illness contexts, spirituality has been shown to enhance self-esteem, generate positive emotions, and promote positive self-care practices<sup>57</sup> by encouraging individuals to refrain from unhealthy lifestyle practices, which in turn foster well-being.<sup>58</sup> Our study highlights the importance of supporting and, when possible, facilitating the spiritual needs of survivors (and their families) and also the salience of identifying those who may lack such protection.

Our study went beyond traditional studies of spirituality to examine its association on the care dyad. It is the transactional nature (the ways members of a care dyad influence one another emotionally and through their behaviors) that is key to understanding how stroke dyads experience, navigate, and manage the illness together and underscores the importance of taking

a dyadic approach to the study of illness. More importantly, it emphasizes the need for a dyadic approach to how we intervene and support the dyad as they manage and cope with illness together.<sup>42</sup>

Although we found that care partner spirituality played an important protective factor for their own physical and psychological QOL, consistent with previous research, there was no significant moderating role of care partner spirituality for either member of the dyad. Examining the spirituality of care partner and survivor simultaneously clearly revealed that survivor spirituality played an important role for the health of the dyad. It may be that survivors, who were primarily the parent of the care partner and older, were more likely to be spiritual and looked up to by the care partner. It may be that the survivor's spirituality influenced not only their own abilities of coping with the uncertainties of a life with disability but also had an association on their care partners' coping abilities or led to perceptions of less burden or greater rewards providing care. At baseline, stroke survivors' and care partners' average spirituality scores were 43.8 (+15.8) and 45.6 (+12.7), respectively. Compared with other population,<sup>50,61</sup> our stroke survivors' and care partners' spirituality scores were lower. Probably because in our sample we analyzed spirituality after a traumatic life experiences, such as a stroke, differently from other studies<sup>50,61</sup> where authors analyzed spirituality in healthy population.

Finally, spirituality did not significantly predict or moderate longitudinal associations. This may well be because of the fact that baseline was the time when the stroke survivor was discharged from neurorehabilitation. This may have been a time of particularly strong optimism and faith as survivors and care partners were in the first phase of the return home and confident about the future, the survivor's recovery, and believing that everything will return to normal. With the passage of time, there may be realization that the stroke has brought a whole series of difficulties and challenges that do not all lessen with time. It may also be possible that spirituality is a prevailing, stable concept, so that benefits are seen at the beginning but there is no increasing benefit with time. Clearly, further longitudinal work is needed to more fully understand the role of spirituality on the health of the dyad over time and whether levels of spirituality change over the course of illness.

This study has several implications. Clinical implications include the importance of considering the role of spirituality within the stroke survivor-care partner dyad, particularly in European countries and other cultures around the world where spirituality plays a significant role in how people deal with adversity. For example, in the Mediterranean area, where this study was conducted, spirituality has always been believed to be an important factor in maintaining health. This study confirms this important role and highlights the relevance of the concept to healthcare providers where spirituality may be deeply rooted in their cultures and traditions. Our study emphasizes the importance for clinicians to view survivors holistically; not just as a patient with symptoms and disabilities, but also as an individual made up of emotional needs, suffering, hopes, faith, religious beliefs, and desires and also part of an interdependent unit with their care partner. Strengths of the study included the large sample and dyadic approach. This is the first study to examine spirituality as moderator in a stroke population. Although several studies have clearly shown that depressive symptoms in stroke survivors and care partners decreases their QOL, previous research has not yet examined the role of potential moderators of the association. Identifying survivors and care partners who have lower spirituality, and therefore, fewer resources to cope is important for optimizing the health of the dyad.

This study has several limitations. First, although we have examined spirituality as “an individual’s perception of life within the context of the culture and value systems of the society and in relation to the individual’s goals, expectations, standards, and concerns”<sup>21</sup> and not as religiosity, our sample was drawn from a predominantly Catholic country. Future research with other religious affiliations may be needed to replicate the findings beyond a Christian culture. Our study was conducted in one European country, limiting the generalizability of the study. Another limitation involves the possible conceptual overlap between the measure of spirituality and that of psychological QOL, although there may be greater conceptual overlap between spirituality and coping (not measured in the current study). More research is needed to untangle the roles of spirituality and coping and psychological QOL. Finally, our sample only included stroke survivors with low-medium disabilities and without significant comorbidities. It would be important to examine these associations in a sample of survivors with more severe illness.

## Conclusions

Despite these limitations, the findings from this study have broad implications for the role of spirituality in relation to QOL in medical-health contexts and the importance of examining such concepts within a dyadic framework. Greater awareness of the importance of spirituality among clinicians and nurses may improve cultural competence in healthcare services and community support in addressing survivor spirituality and strengthen collaborative relationships between healthcare and faith-based organizations to benefit the health of both survivors and their care partners.

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## Disclosures

None.

## Footnotes

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