

# Dealing with a life changing event

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## Clinical paper

## Dealing with a life changing event: The influence of spirituality and coping style on quality of life after survival of a cardiac arrest or myocardial infarction<sup>☆</sup>



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### ABSTRACT

**Background:** Survivors of a cardiac arrest often have cognitive and emotional problems. As a cardiac arrest is also an obvious life-threatening event, other psychological sequelae associated with surviving such as spirituality may also affect quality of life.

**Objectives:** To determine the relationship between spirituality, coping and quality of life in cardiac patients both with and without a cardiac arrest.

**Methods:** In this retrospective cohort study, participants received a questionnaire by post. The primary outcome measure was quality of life (LiSat-9). Secondary outcome measures were spiritual well-being (FACIT-Sp12), coping style (UPCC), emotional well-being (HADS, IES), fatigue (FSS) and daily activities (FAI). Statistical analyses included multiple regression analyses.

**Results:** Data were available from 72 (60% response rate) cardiac arrest survivors and 98 (47%) patients with a myocardial infarction. Against our hypothesis, there were no differences in spirituality or other variables between the groups, with the exception of more depressive symptoms in patients with myocardial infarction *without* arrest. Analysis of the total data set (170 participants) found that a better quality of life was associated with higher levels of meaning and peace in life, higher levels of social and leisure activities, and lower levels of fatigue.

**Conclusions:** Quality of life after a cardiac arrest and after a myocardial infarction without arrest are not different; fatigue, a sense of meaning and peace, and level of extended daily activities are factors related to higher life satisfaction.

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### Introduction

In the Netherlands, the overall incidence of cardiac arrest is 0.6–0.9 per 1000 persons per year.<sup>1,2</sup> During a cardiac arrest, the brain suffers from hypoxia, which may cause diffuse hypoxic–ischemic injury and often results in long-term cognitive impairments.<sup>3–5</sup> Furthermore, cardiac arrest survivors often report severe fatigue,<sup>6</sup> feelings of anxiety and/or depression.<sup>6,7</sup>

and posttraumatic stress reactions.<sup>6</sup> Fortunately, but also remarkably, quality of life (QoL) after cardiac arrest seems only slightly decreased compared to the general population.<sup>8</sup>

A closer look at QoL after cardiac arrest reveals that it is less associated with medical variables, but more with cognitive complaints, anxiety/depression, posttraumatic stress reactions and difficulties in daily activities.<sup>6,9,10</sup> This may implicate that differences in responding to the traumatic event of a cardiac arrest may account for variances in quality of life. Two examples of influence are spirituality and coping style.

Spirituality can be defined as a framework that provides people with a sense of ultimate purpose and meaning in life, offering people stability, support and direction in critical times.<sup>11</sup> Increasing interest has been shown in the association between spiritual

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well-being and QoL.<sup>12–14</sup> Patients with terminal cancer, HIV and heart failure and a higher level of spiritual well-being seemed less depressed.<sup>15,16</sup> Furthermore, higher spiritual well-being may result in better life satisfaction.<sup>11,17</sup> As surviving a cardiac arrest can be a life changing event, it may also change a patient's outlook on life and spirituality.<sup>18</sup>

Coping has been defined as 'the person's cognitive and behavioural efforts to manage the internal and external demands of the person-environment transaction that is appraised as taxing or exceeding the person's resources'.<sup>19</sup> In heart failure patients coping appeared to influence emotional state.<sup>20</sup> In patients with subarachnoid haemorrhage, a passive coping style influenced health-related QoL negatively<sup>21</sup> and in brain injury patients, both increases in active problem-focused coping and decreases in passive emotion-focused coping predicted a higher QoL.<sup>22</sup>

So far, the relationship between spirituality, coping style and QoL has not been studied in cardiac arrest survivors. The aim of the present study was to investigate how spiritual well-being and coping are related to QoL two years after a cardiac arrest.

We hypothesized that cardiac arrest survivors, as a consequence of their brain injury, would have a lower level of functioning regarding emotional well-being and fatigue than cardiac patients without a cardiac arrest. In addition, we hypothesized that cardiac arrest survivors would report higher spiritual well-being, as we considered that a cardiac arrest would influence life more as compared to a myocardial infarction. Moreover, we hypothesized a positive contribution of higher spiritual well-being and active coping style on QoL for both cardiac patients with and without a cardiac arrest.

## Methods

For this study, data were collected from two groups: cardiac arrest survivors and patients who suffered from a myocardial infarction without cardiac arrest. Patients with a myocardial infarction without cardiac arrest were chosen as a control group, as they were considered most comparable in baseline characteristics such as age, gender and underlying cardiac pathology, and they also were likely to perceive a risk of sudden death. By comparing both groups, the additional impact on life of a cardiac arrest will be studied.

Potential participants with a cardiac arrest were derived from a database of a prospective cohort study called Activity and Life after Survival of a Cardiac Arrest (ALASCA).<sup>23</sup> The inclusion criteria for the ALASCA study were: (1) survivor of a cardiac arrest, (2) living within 50 km of a participating hospital, (3) age 18 years or older, and (4) sufficient knowledge of the Dutch language. Patients were recruited from coronary care units and intensive care units of Dutch hospitals from April 2007 till 2010 and followed for one year. For the present study, ALASCA-participants with a cardiac arrest before April 2009 who had given consent to be approached for follow-up studies were invited to participate two years after the event.

Participants with a myocardial infarction without cardiac arrest were identified out of patient files of the Department of Cardiology of the University Hospital Maastricht, The Netherlands. Patients admitted to the department between July 2008 and January 2009 with myocardial infarction, aged 18 years or older and with sufficient knowledge of the Dutch language were identified as potential participants and were also invited to participate two years after the event.

## Data collection

Two years after their cardiac event, all potential participants were invited to participate in the study by sending them an information letter, a set of questionnaires and an informed consent form by post. One reminder was sent. The study protocol was approved

by the Medical Ethics Committee of the University Hospital Maastricht.

## Measurement instruments

Socio-demographic variables regarding marital status, living situation and work situation were collected by self-report.

Quality of life, the main outcome of interest, was measured using the **Life Satisfaction Questionnaire (LiSat-9)**, designed to assess the level of satisfaction with the present living situation. It consists of nine items (satisfaction with life in general and with eight life domains), scoring from 1 (very dissatisfied) to 6 (very satisfied). Its internal consistency is satisfactory (Cronbach alpha 0.74).<sup>24</sup>

Spiritual well being was measured using the **Functional Assessment of Chronic Illness Therapy–Spiritual Well Being (FACIT-Sp12)** scale, a 12-item questionnaire measuring overall spiritual well-being divided over 2 subscales (meaning/peace and faith) with item scores ranging from 0 (not at all) to 4 (very much). Both subscales have a high internal consistency, and show good reliability and validity.<sup>15,25</sup>

Coping style was measured using the **Utrecht Proactive Coping Competence scale (UPCC)**, a questionnaire assessing an individual's competency with regard to proactive coping, using 21 items with scores ranging from 1 (not at all capable) to 4 (capable). Cronbach alpha ranges from 0.83 to 0.95.<sup>26</sup>

Emotional well-being was measured using the **Hospital Anxiety and Depression Scale (HADS)**, a questionnaire designed to assess mood disorders in non-psychiatric hospital outpatients. It consists of 14 items divided in two subscales, directed at measuring signs of anxiety and depression. Validity, internal consistency and reliability are good.<sup>27</sup>

The **Impact of Event Scale (IES)**, a 15-item questionnaire assessing stress reactions after traumatic events was used to measure the significance of the event to the particular patient. Validity and reliability are good.<sup>28</sup>

Fatigue was assessed using the **Fatigue Severity Scale (FSS)**, a 9-item questionnaire assessing the impact of fatigue on patients' functioning. Each item is scored on a 7-point scale and the total score is the overall mean (range 1–7). The scale has good psychometric properties.<sup>29</sup>

Extended activities of daily living were measured using the **Frenchay Activities Index (FAI)**, a 15-item questionnaire for instrumental activities of daily living (ADL) with item scores ranging from 0 to 3. It is valid and reliable measure as assessed in stroke.<sup>30,31</sup>

## Statistical analysis

Possible age- or gender related differences between responders and non-responders in both groups were investigated using *t*-test or Mann–Whitney testing (depending on parametric distribution) for age and chi-square testing for gender. To detect baseline differences between groups, similar tests were performed for age and gender, Mann–Whitney testing for time since event and chi-square testing for current marital status and living situation.

In case of <15% missing values, missing data were imputed by the mean score per instrument. In case of ≥ 15% missing values in a questionnaire, a total score was not calculated. In the cardiac arrest group, scores on all questionnaires, except the FAI, showed a non-parametric distribution.

To detect statistical significant differences between variables in both groups, Mann–Whitney 2 testing was performed. A *p*-value of ≤ 0.05 was considered statistically significant.

Multiple linear regression analyses (ENTER method) were carried with independent variables spiritual well-being (subscales 'meaning & peace', 'faith' (FACIT-Sp12), coping style (UPCC), emo-

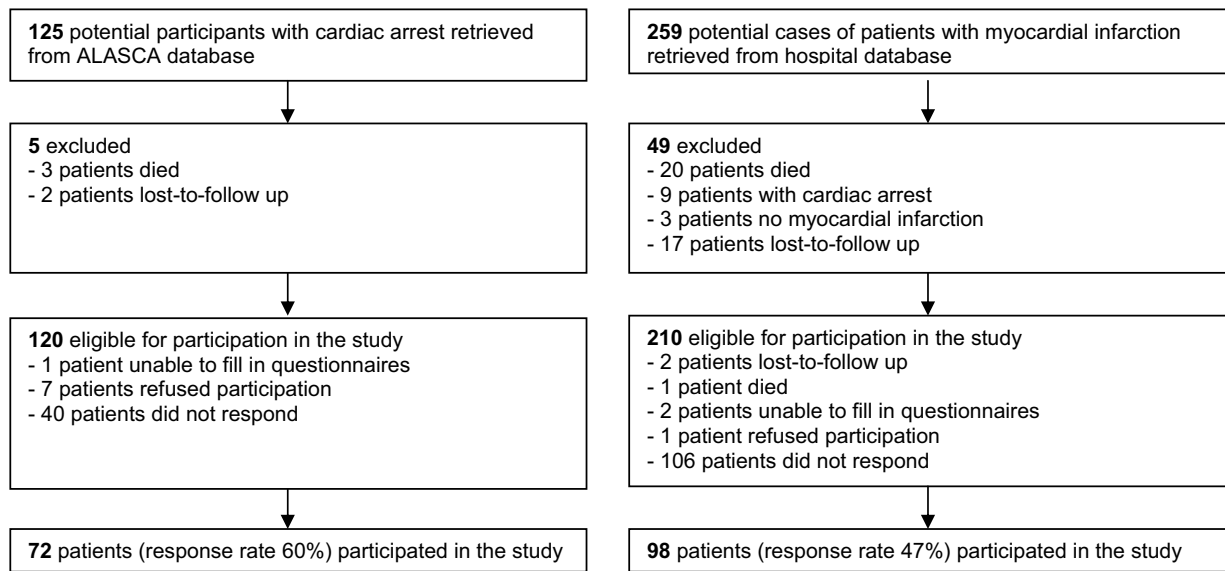


Fig. 1. Flow chart of patient inclusion.

tional well being (HADS and IES), fatigue (FSS), daily functioning (FAI) and group (cardiac arrest versus myocardial infarction)) and the dependent variable QoL (LiSat-9).

To rule out different pathways or relationships within both groups, potential interactions of the variable “study group” with the variables “spiritual well-being”, “emotional well-being”, “age” and “gender” were analysed. A similar check was performed for interaction between spiritual and emotional well-being. Age and gender were introduced in the model as potential confounders. A limit value for elimination in the regression analyses was set at  $p < 0.10$  and a  $p$ -value  $\leq 0.05$  was considered statistically significant. Regression models were checked for co-linearity and outliers. Analyses were performed using SPSS software version 20.0 (SPSS Inc., Chicago, Illinois, USA).

## Results

Fig. 1 shows that 72 patients (response rate 60%) with a cardiac arrest and 98 patients (response rate 47%) with a myocardial infarction participated.

Table 1 shows the characteristics of all participants. There were neither statistically significant gender-related nor age-related differences between responders and non-responders in the cardiac arrest group and the myocardial infarction group. Participants with a myocardial infarction were significantly older and more often female as compared to the cardiac arrest group.

### Current level of functioning

Table 2 shows scores for basic functioning, activities in daily living and QoL (following the ICF-domains<sup>32</sup>).

In general, the level of functioning on different domains is good for both groups, except for fatigue, which is present in over half of all participants. Also, the level of functioning is comparable between both groups. Only the total score of the HADS and its subscale depression were higher in the myocardial infarction group compared with the cardiac arrest group.

Participants were also asked if they suffered from any other medical problems influencing their functioning in daily life. This was the case in 19 (26%) cardiac arrest survivors and 37 (38%) patients in the control group (chi-square = 2.505,  $p = 0.113$ ).

### Variables related to quality of life

Regression analysis did not confirm different pathways or relationships between variables within groups, as all analyses to test interactions and confounders were negative (results not shown). Therefore, the group of both cardiac arrest and myocardial infarction patients were analysed together to study the contribution of spiritual well-being and coping, emotional well-being, fatigue and daily functioning on QoL.

Table 3 shows that the subscale ‘meaning & peace’ of the FACIT-Sp12 contributed positively to QoL; a higher sense of meaning and peace was associated with higher life satisfaction. Also, less fatigue and a more independent level of daily functioning were associated with a higher quality of life, explaining 59% of the variance in the model. Coping style and emotional well-being did not have any significant effect on QoL.

## Discussion

This study found that cardiac arrest does not have a specific impact on quality of life in people with cardiac disease, and that the factors associated with higher life satisfaction two years after an acute cardiac event are a higher level of social and leisure activities, a lower level of fatigue and a higher level of a sense of meaning and peace. Coping style had no influence.

In this study, cardiac arrest survivors were compared with myocardial infarction patients, and we expected that cardiac arrest survivors would experience more emotional problems and fatigue (as a consequence of hypoxic brain injury), and would have a higher level of spiritual well-being (due to the higher impact of the event). In fact we found a quite good and also comparable level of functioning in both groups. *Fatigue* was notably a frequently reported problem in both groups, and a lower level of *emotional well-being* (especially depressive symptoms) was found in the group who had a myocardial infarction without cardiac arrest. The presence of emotional problems (30% in the cardiac arrest group and 40% in the myocardial infarction group) is comparable with numbers found in stroke patients.<sup>33,34</sup>

The lower level of *emotional well-being* in the myocardial infarction group may, to some extent, be explained by differences in age and gender. Previous studies described that older age and female gender were negatively related to the patient’s functioning and

**Table 1**  
Demographic characteristics of the participants.

	Cardiac arrest (N = 72) Current situation	Myocardial infarction (N = 98) Current situation	p-Value
Time since cardiac event (days)			0.70
Median	744	748	
Range	698–932	712–783	
Age			<b>&lt;0.001</b>
Mean (SD)	59.8 (11.5)	66.6 (11.7)	
Range	29–82	37–90	
Gender			<b>0.002</b>
Male	66 (92%)	71 (72%)	
Female	6 (8%)	27 (28%)	
Marital status			0.08
Married/living with partner	57 (79%)	73 (74%)	
Unmarried/divorced/widowed	3 (4%)	20 (20%)	
Unknown	12 (17%)	5 (5%)	
Living situation			<b>0.03</b>
Home (independent)	61 (85%)	69 (70%)	
Home (with help from others)	6 (8%)	24 (25%)	
Sheltered housing	–	1 (1%)	
Nursing home	–	1 (1%)	
Unknown	5 (7%)	3 (3%)	

**Table 2**  
Basic functioning, activities in daily living and quality of life of the participants.

ICF domain	Range of questionnaire	Cut-offscore	Cardiac arrest (N = 72)		Myocardial infarction (N = 98)		p-Value
			Mean (SD)/median (range)	No (%) impaired	Mean (SD)/median (range)	No (%) impaired	
Basic functioning							
Spiritual well-being (FACIT-Sp12)	0–48	–	32 (4–46)	–	31 (8–48)	–	0.41
Emotional well-being (HADS)	0–42	≥11	5 (0–31)	21 (30%)	9 (0–36)	38 (40%)	<b>0.02</b>
– Subscale anxiety	0–21	≥9	3 (0–15)	16 (23%)	4 (0–20)	17 (18%)	0.17
– Subscale depression	0–21	≥9	2 (0–20)	14 (20%)	4 (0–19)	19 (20%)	<b>0.01</b>
Stress reactions (IES)	0–75	≥26	11 (0–63)	19 (27%)	11 (0–59)	22 (23%)	0.51
Fatigue (FSS)	1–7	≥4	4.0 (1–7)	35 (51%)	4.3 (1–7)	57 (60%)	0.07
Activities of daily living							
Instrumental daily activities (FAI)	0–45	≤16	27.3 (7.4)	6 (9%)	28.0 (1–44)	10 (11%)	0.63
Quality of life							
Life satisfaction (LiSat-9)	1–6	≤4	5.0 (2.8–6.0)	15 (22%)	4.8 (1.9–6.0)	12 (14%)	0.35
Other							
Coping style (UPCC)	1–4	–	3.1 (1–4)	–	3.1 (1.5–4)	–	0.98

**Table 3**  
Final model from multiple linear regression analyses (ENTER method) N = 144.

Dependent variable	Independent variables	R <sup>2</sup>	Adjusted R <sup>2</sup>	Standardized beta	p-Value
LiSat-9		0.59	0.57		0.00
	Spiritual well-being; meaning/peace (FACIT-Sp 12)			0.50	<b>0.00</b>
	Spiritual well-being; faith (FACIT-Sp12)			–0.05	0.40
	Coping style (UPCC)			0.05	0.50
	Emotional well-being (HADS)			0.03	0.80
	Stress reactions (IES)			–0.11	0.15
	Fatigue (FSS)			–0.25	<b>0.00</b>
	Instrumental daily activities (FAI)			0.14	<b>0.04</b>
	Group (cardiac arrest versus myocardial infarction)			–0.04	0.49

Dependent variable: LiSat-9, Life Satisfaction Questionnaire.

Independent variables: FACIT-Sp12, Functional Assessment of Chronic Illness Therapy—Spiritual Well-being scale, score on subscale meaning/peace and faith; total score on UPCC, Utrecht Proactive Coping Competence scale; HADS, Hospital Anxiety and Depression Scale; IES, Impact of Event Scale; FSS, Fatigue Severity Scale; FAI, Frenchay Activities Index; and research group (cardiac arrest group or myocardial infarction).

QoL.<sup>35,36</sup> In addition, differences in medical condition may also explain some of the findings: patients with a myocardial infarction can have negative illness perceptions which increase over time and can result in increased feelings of *fatigue*.<sup>37</sup> Also, use of medication may have affected fatigue and emotional wellbeing.

Finally, the analysis of the cohort was done irrespective of treatment. However, about one third of the cardiac arrest survivors

received a new early intervention service during their participation in the ALASCA study and this intervention appeared to be effective in improving mood and quality of life.<sup>38</sup> This therefore may have led to better overall levels of functioning in the cardiac arrest group.

The absence of higher levels of *spirituality* in the cardiac arrest group may be due to underestimation of the impact on life of a myocardial infarction. Based on our results, it could be hypothe-

sized that the impact of an event such as a myocardial infarction is experienced as equally life threatening, and may therefore be equally life changing with similar effects on spiritual well-being. This theory seems supported by comparable mean scores on the Impact of Event Scale for both groups. Although the mean score is relatively low, the range is large indicating that a subgroup of patients within both groups is still experiencing significant stress reactions related to the cardiac event two years later.

The construct of spirituality is complex and still under much debate. Some suggest it might be regarded as a construct, which is present in the whole being of a person to a more or less extent but will not change much over time. Then, serving as a coping resource and helping people dealing better with adversity, the level of spiritual well-being within a person might eventually define the impact of an event.<sup>39</sup> So a more spiritual person might be more capable dealing with a cardiac event and as a result be less depressed and experience a higher QoL. Others however suggest that spirituality is a developmental process within a person,<sup>40</sup> and that posttraumatic growth of spirituality can be seen.<sup>41,42</sup> More research is needed in this field.

Spirituality, fatigue and daily activities contributed significantly to QoL, whereas coping style and emotional well-being did not. We checked whether age, gender, or group were possible interacting or confounding factors, but this was not the case.

A previous study showed that QoL was related to emotional problems, fatigue, daily activities and cognitive complaints.<sup>10</sup> In the present study cognition was not taken into account. The frequency of emotional problems was relatively high. However, since emotional problems did not contribute to QoL, spirituality may have overpowered the impact of emotional problems. The fact that coping style was not related to QoL was unexpected, as in other cardiovascular diseases an influence was shown.<sup>20</sup>

There are several limitations to our study. First, the recruitment of patients with a cardiac arrest and with a myocardial infarction without cardiac arrest differed. Patients with a cardiac arrest were originally asked to participate in the ALASCA study. Baseline data were collected immediately after the event. Patients with a myocardial infarction were invited two years after the incident and for baseline data we had to rely on patient's files. Selection bias is possible, due to the fact that more patient with cardiac arrest responded than those with a myocardial infarction (60% versus 47%). Cardiac arrest survivors were already part of an on-going follow up study (the ALASCA study) which may have made them more committed to respond. One would expect a smaller percentage of the myocardial infarction group to have neurocognitive consequences as the brain is most likely not involved in the event. Selection bias is also possible due to the fact that there is no further background information available regarding the non-responders.

Secondly, even though there is increasing interest in spirituality and coping, and their effect on functioning and QoL, these are still concepts difficult to understand and study.

Last, many other factors, not assessed in our study, may show associations with QoL. For instance, Brands et al. showed that self-efficacy predicts long-term QoL in brain injured patients.<sup>43</sup> Further research is necessary.

Further research based on prospective studies with larger samples is needed. Both on the subject of spirituality and coping and the influence on QoL. This way, spirituality and coping can be taken more into account when treating patients after a cardiac event. In a recent qualitative study nurses experiences in spiritual care were examined and the authors concluded that spirituality could be of relevance to all areas of nursing care.<sup>44</sup> As a clinical implication of the current findings can be mentioned that for both patients with a cardiac arrest and a cardiac infarction, it seems important to focus on spirituality as it positively contributed to QoL, whereas fatigue influenced it in a negative way. Learning patients how to

cope with fatigue could probably add to their QoL. Whether, in addition, spirituality can also be influenced in a positive way needs further study.

## Conclusion

This study investigated the influence of spirituality and coping style on QoL after a cardiac arrest. Spirituality positively contributed to QoL, whereas coping style did not have an additional effect. Furthermore, fatigue and daily functioning also contributed significantly. Spirituality and fatigue are both factors that should be addressed after a cardiac event.

## Conflict of interest statement

We hereby declare that none of the participating authors of the manuscript "Dealing with a life changing event: the influence of spirituality and coping style on quality of life after survival of a cardiac arrest" had any potential conflicts regarding financial, personal or other relationships that might have biased their work.

Potential conflict of interest: none declared.

## Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://dx.doi.org/10.1016/j.resuscitation.2016.09.025>.

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