



## Pre-operative Request for Spiritual Care and Surgical Outcome in Patients Undergoing Elective Cardiac Surgery

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### Abstract

In a retrospective study of 5,497 patients undergoing elective cardiac surgery, we compared the surgical outcome for 74 patients asking for pre-operative spiritual care with the outcome of the other 5,423 patients. The spiritual support group was older ( $p=0.004$ ), incorporated relatively more females ( $p=0.013$ ), and experienced higher mortality ( $p=0.033$ ). Multiple logistic regression analysis singled out age as predicting factor for death within the first year postoperatively ( $p < 0.001$ ). We suggest that in patients asking for pre-operative spiritual support, cardiac surgeons and spiritual counsellors need to be aware of these findings and may adjust their counselling.

**Keywords:** Cardiac Surgery; Spiritual Care; Surgical Outcome; Pre-Operative Counselling; Mortality

### Introduction

Religious sources of family support, such as prayers, have been reported to reduce stress and anxiety related to hospitalization in general [1-3]. Distinct subjective benefits to cope with surgically related stress in patients undergoing cardiac bypass surgery have been found [2,4,5]. An inverse relation between patients' prayer frequency and complications following coronary artery bypass surgery has been published [6]. Psychological or spiritual professional interventions have not shown effectiveness in relation to mortality after bypass surgery [7].

In this study, it was investigated whether patients scheduled for elective cardiac surgery, and asking upon intake for spiritual support, encounter unfavorable outcome. The spiritual support comprised of one hour bedside or ambulant counseling by a spiritual hospital counsellor, one day before the operation.

### Methods

#### Setting and design

In a retrospective quantitative analysis of 6,175 patients in a tertiary high-volume cardiac surgery facility, 5,497 (89.0%) patients were electively operated by a group of 7 different surgeons during 56 consecutive months from December 1<sup>st</sup> 2012 till August 31<sup>st</sup>, 2017. From this historical cohort of patients, 74 (1.3%) patients, comprising 43 (58.1%) males, and 31 (41.9%) females, requested pre-operative spiritual support in the hospital (PSS group). The rest of the cohort, 5,497 patients, was designated as the control group (CG). The distribution of gender, pre-operative expected mortality (expressed as mean EuroSCORE I and logistic EuroSCORE I), type of surgery (restricted to the largest care groups: Coronary Artery Bypass Grafting (CABG), Aortic Valve Replacement (AVR), or combined AVR + CABG), and postoperative complications as death, heart attack, re-sternotomy for bleeding, mediastinitis, and cerebral

stroke were studied. With respect to mortality the follow-up lasted up to May 6<sup>th</sup> 2019. The follow-up for the other complications was restricted to one year.

**Statistics**

Categorical variables are presented as absolute values, with percentages added between brackets. They were tested by means of the Fischer’s exact test, or the Fisher-Freeman-Halton exact test in case of more than two categories. Continuous variables are presented by their means, with between brackets plus or minus the standard deviations, or by their medians, with between brackets their interquartile ranges, in case of a normal distribution or a skewed distribution, respectively. They were tested by the unpaired t-test or the Mann-Whitney U test in case of a normal or skewed distribution, respectively. Univariate and multiple logistic regression for death

within 1 year post-surgery was applied, correcting for differences in some of the baseline characteristics.

**Results**

**Baseline characteristics**

Table 1 presents baseline characteristics of both groups with regard to age, gender and risk stratification. There was a significant difference between both groups for age and gender: the PSS group was older 75 (63-76) vs 70 years (68-70) (p = 0.004), and the percentage of women in the PSS group (41.9%) was higher than that in the Control Group (28.3%) (p = 0.013). There were no differences between the two groups with regard to the distribution of expected mortality (in terms of mean EuroSCORE I and logistic EuroSCORE I). Also, the type of surgery, performing surgeon [7] and the year of operation (2012 up to 2017) did not differ between the two groups (data not shown).

	Total (N = 5497)	PSS group (N = 74)	Control group (N = 5423)	p
<b>Demographic</b>				
Age	70 (63 - 76)	75 (68 - 78)	70 (63 - 76)	0.004
Gender				0.013
Male	3930 (71.5%)	43 (58.1%)	3887 (71.7%)	
Female	1567 (28.5%)	31 (41.9%)	1536 (28.3%)	
<b>Risk</b>				
EuroSCORE I	5.5 (±3.1)	6 (±2.9)	5.5 (±3.1)	0.261
Logistic EuroSCORE I	4.3% (2.3 - 8.6)	5% (2.9 - 7.9)	4.3% (2.2 - 8.6)	0.202

**Table 1:** Characteristics.

**Inferential testing**

Table 2 represents the outcomes of the patients’ surgeries. A higher percentage of patients in the PSS group than in the control group died within 30 days (4.1% vs 1.5%, respectively), and between 30 and 365 days (2.7% vs 2.3%, respectively) postoperatively, while most notably after a year postoperatively the control group showed a much higher percentage than the PSS group (9,0% vs 4.1%, respectively). The differences in this pattern were significant (p = 0.033). The location of demise (ICU, follow-up ward in the hospital, and outside the hospital) made no difference between the two groups (data not shown). No remarkable differences between

the groups were observed for other postoperative complications. The combination of those complications with mortality just falls short of significance (p = 0.055). Univariate and multiple logistic regression analysis was executed on the end point mortality within 1 year (Table 3). Age appears to be a significant predictor for death within the first year postoperatively. In the multiple analysis, adjusting for the combination of effects, the effect of gender disappears (95% Confidence Interval 0.734 - 1.329; p=0.935), singling out age as the predicting factor (95% Confidence Interval 1.067 - 1.105; p < 0.001). Neither in the univariate nor in the multiple analysis group membership (PSS or CG) is a significant factor.

	Total (N = 5497)	PSS group (N = 74)	Control group (N = 5423)	p
<b>Mortality</b>				
Tracking time (+1) in days	1316.4 (± 542.7)	1288.8 (± 520.9)	1316.7 (± 543)	0.660
Mortality				0.033
≤ 30 days	84 (1.5%)	3 (4.1%)	81 (1.5%)	
>30 - ≤ 365 days	129 (2.3%)	2 (2.7%)	127 (2.3%)	
>365 days	492 (9%)	3 (4.1%)	489 (9%)	
<b>Complications ≤ 1 year</b>				
Myocardial infarction ≤ 1 year	70 (1.3%)	1 (1.4%)	69 (1.3%)	0.615
Stroke ≤ 1 year	33 (0.6%)	2 (2.7%)	31 (0.6%)	0.072
Resternotomy ≤ 1 year	142 (2.6%)	3 (4.1%)	139 (2.6%)	0.441
Mediastinitis ≤ 1 year	39 (0.7%)	1 (1.4%)	38 (0.7%)	0.412
Total number of complications ≤ 1 jaar				0.204
0	5224 (95%)	67 (90.5%)	5157 (95.1%)	
1	263 (4.8%)	7 (9.5%)	256 (4.7%)	
2	9 (0.2%)		9 (0.2%)	
3	1 (0.0%)		1 (0.0%)	
<b>Combination of complications and mortality</b>				
1 Only complication(s)	205 (3.7%)	3 (4.1%)	202 (3.7%)	0.055
2 Only mortality ≤ 30 days	59 (1.1%)	1 (1.4%)	58 (1.1%)	
3 Only mortality > 30 days - ≤ 1 year	117 (2.1%)	1 (1.4%)	116 (2.1%)	
4 Complication(s) + mortality ≤ 30 days	56 (1.0%)	3 (4.1%)	53 (1.0%)	
5 Complication(s) + mortality >30 days - ≤ 1 year	12 (0.2%)	1 (1.4%)	11 (0.2%)	
6 Not 1 - 5	5073 (91.8%)	65 (87.8%)	4983 (91.9%)	

Table 2: Outcomes.

	Univariate analysis				Multiple analysis			
	B	Exp(B)	95%CI Exp(B)	p	B	Exp(B)	95%CI Exp(B)	p
Group (PSS = 0, Control = 1)	0.597	1.817	0.725 - 4.551	0.202	0.429	1.536	0.607 - 3.887	0.365
Age	0.082	1.086	1.067 - 1.105	< 0.001	0.082	1.086	1.067 - 1.105	< 0.001
Gender (female = 0, male = 1)	-0.344	0.709	0.532 - 0.944	0.019	-0.012	0.988	0.734 - 1.329	0.935

Table 3: Logistic regression analysis on the end point mortality ≤ 1 year.

**Discussion**

This is the first study to address the hunch of spiritual counselors that patients scheduled for elective cardiac surgery and requesting spiritual care might encounter unfavorable outcomes. The main finding of this study was that elderly female patients encountered higher postoperative mortality during the first postoperative year, and especially within the first 30 days postoperatively,

compared to other patients. As the pre-operative EuroSCORE I and the type of surgery was not different between the two groups, it can be concluded that there were no differences in the severity of the underlying cardiac diseases. It is commonly known that women have a higher mortality risk after coronary artery bypass surgery compared with men, even more pronounced so in the younger age groups [8]. Secondly, the overall mortality risk after cardiac surgery

increases with age [9,10]. Because in a rapidly secularising country as the Netherlands institutional religious practice too correlates positively with both age and female gender, it should not surprise us that elderly female patients have a greater risk of postoperative mortality and also ask for religious support [11,12].

In our hospital we use the terms ‘spiritual care’ and ‘spiritual counsellor’ rather than ‘pastoral care’ and ‘hospital chaplain’, to signal this care is open for all patients with existential, spiritual or moral questions, irrespective of their beliefs and convictions. In practice, though, when told at intake spiritual care is available to them, elective cardiac surgery patients seem to associate this quite often with an offer of traditional Christian religious support. This could explain the high number of women and especially elder patients in our PSS group compared with the Control group, and at the same time the small total number of patients in the PSS group. Whether the PSS patients have a presentiment of a possible bad outcome when they make the request for such support in the intake procedure cannot be decided by the kind of research reported in this paper. The fact that the PSS group reaches its highest mortality in the first year postoperatively (and especially within the first 30 days), while mortality in the Control group steadily increases after surgery, could hint to such a presentiment as a possible factor in asking for spiritual support.

This study is limited by its adherence to the quantitative method, given the quite small number of patients in the PSS group, while their number in the Control group is of a higher order: 74 vs 5,423. Small numbers and thereby restricted possibilities to come to significant study results are not uncommon in quantitative research on questions of spirituality, as recently had to be noted also in the report of a multicenter trial in which our hospital participated [13]. Secondly, no information is available of the prevalence, nor the distribution in the two groups, of a spiritual background prior to admittance to the hospital. We would advocate additional prospective research to remedy the lack of quantitative power.

## Conclusion

Although the relevant numbers are very small, the results suggest that elderly (female) patients scheduled for elective cardiac surgery, especially those requesting pre-operative spiritual care may encounter higher mortality within the first year postoperatively compared to patients not requesting for this type of care. Cardiac surgeons and spiritual counsellors may be alerted to this finding during their pre-operative informing talk and counseling.

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## Conflict of Interest

All authors declare that they have no conflict of interest.

## Ethical Approval

The retrospective dossier study was not subject to the Dutch Act on Medical Research involving human subjects (WMO).

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