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Clinical paper

Life satisfaction in cardiac arrest survivors: A nationwide Swedish registry study

Stefan Aregger Lundh^{a,b,*}, Johan Israelsson^{b,c}, Peter Hagell^a, Petra Lilja Andersson^a, Kristofer Årestedt^{b,d}

Abstract

Introduction: Most cardiac arrest (CA) survivors report good health and quality of life. Life satisfaction on the other hand has not yet been studied in a large scale in the CA population. We aimed to explore life satisfaction as perceived by CA survivors with three research questions addressed: (1) how do CA survivors report their life satisfaction, (2) how are different domains of life satisfaction associated with overall life satisfaction, and (3) how are demographic and medical factors associated with overall life satisfaction?

Methods: This registry study had a cross-sectional design. Life satisfaction was assessed using the 11-item Life Satisfaction checklist (LiSat-11). The sample included 1435 survivors ≥ 18 years of age. Descriptive statistics and binary logistic regression analyses were used.

Results: Survivors were most satisfied with partner relation (85.6%), family life (82.2%), and self-care (77.8%), while 60.5% were satisfied with overall life. Satisfaction with psychological health was strongest associated with overall life satisfaction. Among medical and demographic factors, female sex and poor cerebral performance were associated with less overall life satisfaction.

Conclusions: Generally, CA survivors seem to perceive similar levels of overall life satisfaction as general populations, while survivors tend to be significantly less satisfied with their sexual life. Satisfaction with psychological health is of special interest to identify and treat. Additionally, female survivors and survivors with poor neurological outcome are at risk for poorer overall life satisfaction and need special attention by healthcare professionals.

Keywords: Health, Heart arrest, Life satisfaction, Quality of life, Survivor

Introduction

Based on quantitative studies, most cardiac arrest (CA) survivors report acceptable levels, similar to the general population, of health-related quality of life (HRQoL) when evaluated with overall assessments such as the EQ-VAS.^{1,2} However, there seem to be several individual health problems related to survivorship such as fatigue, psychological distress, and cognitive impairment,²⁻⁷ and qualitative studies have revealed a wider range of survivor experiences, ranging from joy and gratitude of survival to feelings of vulnerability, fear, anxiety, loneliness, and depression.⁸⁻¹⁰

While the interest in this area has increased rapidly during the last decade, most studies related to CA survivorship have focused on HRQoL. Life satisfaction is another way of evaluating a person's life situation from a broader perspective than HRQoL.¹¹ Life satisfac-

tion can be described as an important component of quality of life that allows for personal values and opinions to be attributed to physical and psychological health, as well as other aspects (e.g., socioeconomic status), which is supported by several concept analysis.¹²⁻¹⁴

Despite this, only a few studies have included life satisfaction as an outcome related to CA survivorship.^{15,16} In a study by Wallin et al., most of the survivors were satisfied with their overall life, while there was a lower degree of satisfaction with sexual life. Another study by Lundgren-Nilsson et al. showed lower satisfaction with overall life and sexual life compared with a general Swedish population. However, no strong conclusions can be drawn as the results are incongruent and the studies are descriptive and based on small samples.

There is a need for population-based studies to increase the knowledge about life satisfaction and associated factors in CA

* Corresponding author at: Linnaeus University, Faculty of Health and Life Sciences, SE - 391 82 Kalmar, Sweden.

E-mail address: stefan.areggerlundh@lnu.se (S. Aregger Lundh).

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survivors. Therefore, this study aimed to explore life satisfaction as perceived by CA survivors with three research questions addressed: (1) how do CA survivors report their life satisfaction, (2) how are different domains of life satisfaction associated with overall life satisfaction, and (3) how are demographic and medical factors associated with overall life satisfaction?

Methods

Design

This registry study had a cross-sectional design. Data was taken from the Swedish Register of Cardiopulmonary Resuscitation (SRCR). The Swedish Ethical Review Authority approved the study (No. 2021-00007).

The Swedish Register of Cardiopulmonary Resuscitation (SRCR)

The SRCR aims to include data from all CA events in Sweden where cardiopulmonary resuscitation (CPR) is initiated; both out-of-hospital (OHCA) and in-hospital cardiac arrests (IHCA). Data is registered on three separate occasions. The first registration occurs in connection to the CA event and includes data about patient characteristics, CA treatment, time, location, and short-term survival. The second registration is conducted 30 days after discharge and includes data about aetiology, comorbidities, post-CA-care, 30 day-survival, and cerebral performance (as assessed using the Cerebral Performance Category classification). The third and last registration is conducted 3–6 months post CA and includes patient-reported outcome measures (PROM). The PROM registration is conducted during a telephone interview, performed by the regional SRCR coordinators, and includes the 11-item Life Satisfaction checklist (LiSat-11).

Participants and procedure

All registered survivors, 18 years and older, who had suffered a CA between 1st January 2018 and 17th September 2021 were screened ($n = 4026$). Of these, 1574 (39%) had completed the PROM registration. Survivors with CPC > 3 (coma, vegetative state, or brain death), proxy registrations, and those who had not completed the LiSat-11 were excluded ($n = 139$). Thus, the final sample included 1435 survivors (Fig. 1). In total, 61% of the survivors were not followed-up with PROM due to severe cognitive impairments, language difficulties, being unreachable, and non-consent. However, in most cases (> 60%), there were no reason reported since several hospitals do not perform the third follow-up.

Study variables

Demographic data about sex and age were used in this study. Variables describing the CA event included place (OHCA/IHCA), location (cardiac cath lab, general ward, heart ICU, emergency department, home, public place, ambulance, other location), witnessed (yes/no), initial rhythm (shockable/non-shockable), mechanical compressions (yes/no), epinephrine (yes/no), antiarrhythmics (yes/no), intubation (yes/no), percutaneous coronary intervention (yes/no), coronary artery by-pass graft (yes/no), target temperature management (yes/no), implantable cardioverter device (yes/no), time to CPR (0–1 min/>1 min), time to defibrillation (0–5 min/>5 min), and PROM reported (≤ 180 days ≥ 180 days).

The Cerebral Performance Category (CPC) at discharge was used as an overall outcome measure for neurological function. The

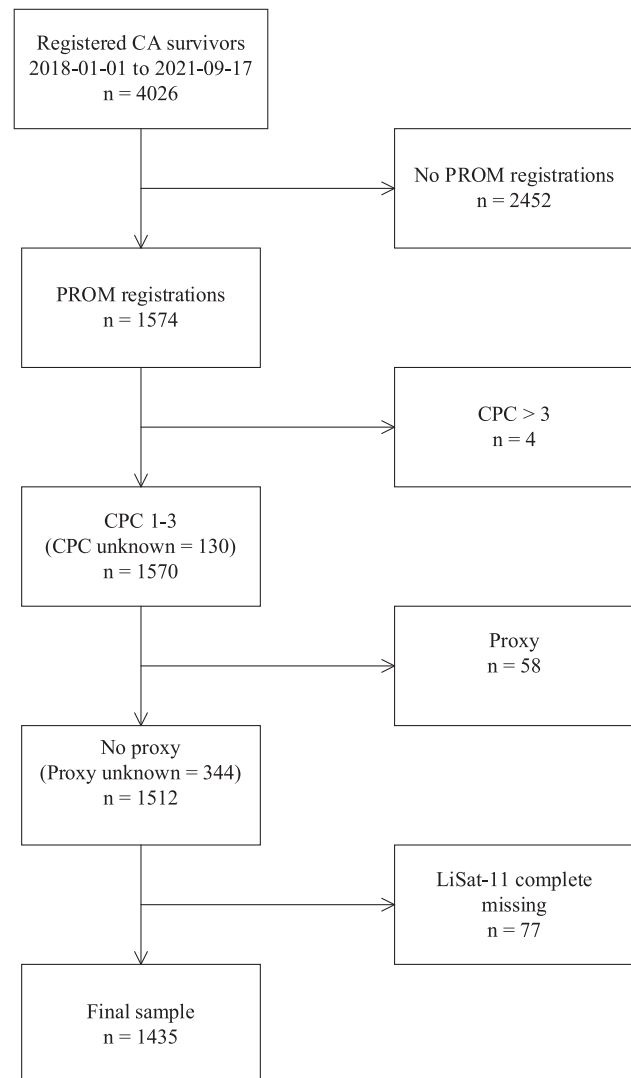


Fig. 1 – Pathway for inclusion.

CPC comprise of five categories: 1 'Good cerebral performance', 2 'Moderate cerebral disability', 3 'Severe cerebral disability', 4 'Coma or vegetative state', and 5 'Brain death'.¹⁷

The LiSat-11 was used to assess life satisfaction. The instrument consists of 11 single items, one representing overall satisfaction with life (life as a whole) and 10 addressing specific domains of life satisfaction (vocation, economy, leisure, friends, sexual-life, self-care, family-life, partner relation, physical health, and psychological health) that are reported as single item measures.¹⁸ Each item is assessed on a 6-point scale ranging from 'Very dissatisfied' (1) to 'Very satisfied' (6). According to the constructor, the responses can be dichotomized into dissatisfied (scores 1–4) and satisfied (scores 5–6).¹⁸ The instrument has demonstrated satisfactory test–retest reliability¹⁹ and external construct validity,²⁰ and has also previously been used in CA survivors.^{15,16}

Data analysis

Descriptive statistics were used to present background data and levels of life satisfaction. To compare the background data between OHCA and IHCA survivors, Pearson's chi-square test was used to

Table 1 – Sample characteristics.

Variable	All, n = 1435	IHCA, n = 937	OHCA, n = 498	p-value
Age, mean (SD) [min/max]	65.9 (13.3) [18/94]	67.5 (12.9) [18/94]	62.9 (13.4) [18/91]	< 0.001 ^b
Sex, n (%)				< 0.001 ^a
Male	1007 (70.3)	617 (65.9)	390 (78.8)	
Female	425 (29.7)	320 (34.2)	105 (21.2)	
Missing	3			
Reported aetiology, n (%)				0.963 ^a
Other cause	501 (37.4)	325 (37.4)	176 (37.4)	
Heart disease	837 (62.6)	544 (62.6)	293 (62.6)	
Myocardial infarction		358 (65.8)	n/a	
Arrhythmia		166 (30.5)	n/a	
Cardiomyopathy		14 (2.6)	n/a	
Other, heart related		6 (1.1)	n/a	
Missing	97			
Initial rhythm, n (%)				< 0.001 ^a
Shockable	862 (70.1)	484 (60.1)	378 (88.9)	
Non-shockable	368 (29.9)	321 (39.9)	47 (11.1)	
Missing	205			
Cerebral Performance (CPC) at discharge n (%)				0.273 ^c
CPC 1	1106 (84.0)	726 (83.4)	380 (85.4)	
CPC 2	153 (11.6)	100 (11.5)	53 (11.9)	
CPC 3	57 (4.3)	45 (5.2)	12 (2.7)	
Missing	119			
Location, n (%)				
Angiolab		213 (22.7)	n/a	
General ward		203 (21.7)	n/a	
Heart ICU		195 (20.8)	n/a	
Emergency department		134 (14.3)	n/a	
Other location. IHCA		192 (20.5)	n/a	
Home		n/a	220 (44.2)	
Public place		n/a	190 (38.2)	
Ambulance		n/a	52 (10.4)	
Other location. OHCA		n/a	36 (7.2)	
Witnessed Cardiac Arrest, n (%)				0.001 ^a
Yes	1322 (92.4)	881 (94.1)	441 (89.1)	
No	109 (7.6)	55 (5.9)	54 (10.9)	
Mechanical compressions, n (%)				< 0.001 ^a
Yes	234 (16.9)	56 (6.2)	178 (37.1)	
No	1149 (83.1)	847 (93.8)	392 (62.9)	
Missing	52			
Epinephrine, n (%)				0.076 ^a
Yes	447 (32.7)	277 (31.1)	171 (35.8)	
No	920 (67.3)	615 (69.0)	305 (64.2)	
Missing	68			
Antiarrhythmics, n (%)				0.188 ^a
Yes	292 (21.6)	181 (20.5)	111 (23.6)	
No	1060 (78.4)	701 (79.5)	359 (76.4)	
Missing	83			
Intubation, n (%)				< 0.001 ^a
Yes	274 (19.9)	218 (24.2)	54 (11.5)	
No	1097 (80.1)	683 (75.8)	414 (88.5)	
Missing	66			
Percutaneous Coronary Intervention (PCI) n (%)				< 0.001 ^a
Yes/planned	597 (41.8)	313 (33.4)	284 (57.8)	
No	830 (58.2)	623 (66.6)	207 (42.2)	
Missing	8			
Coronary Artery Bypass Graft (CABG), n (%)				0.010 ^a
Yes/planned	44 (3.1)	21 (2.2)	23 (4.8)	
No	1376 (96.9)	915 (97.8)	461 (95.3)	
Missing	15			
Targeted Temperature Management (TTM), n (%)				< 0.001 ^a
Yes	227 (16.8)	73 (8.0)	154 (35.0)	
No	1127 (83.2)	841 (92.0)	286 (65.0)	

(continued on next page)

Table 1 (continued)

Variable	All, <i>n</i> = 1435	IHCA, <i>n</i> = 937	OHCA, <i>n</i> = 498	<i>p</i> -value
Missing	81			
Implantable Cardioverter Defibrillator (ICD), <i>n</i> (%)				< 0.001 ^a
Yes/planned	269 (19.7)	95 (10.8)	174 (36.0)	
No	1098 (80.3)	789 (89.3)	309 (64.0)	
Missing	68			
Time to CPR, <i>n</i> (%)				< 0.001 ^a
0–1 min	1039 (85.4)	758 (95.4)	281 (66.8)	
> 1 min	177 (14.6)	37 (4.7)	140 (33.7)	
Missing	219			
Time to defibrillation, <i>n</i> (%)				< 0.001 ^a
0–5 min	583 (69.2)	440 (94.4)	143 (38.0)	
> 5 min	259 (30.8)	26 (5.6)	233 (62.0)	
Missing	593			

IHCA = In Hospital Cardiac Arrest.

OHCA = Out of Hospital Cardiac Arrest.

CPR = Cardiopulmonary Resuscitation.

^a Pearson chi-square test.

^b Independent sample t-test.

^c Mann-Whitney U test.

compare binary data, whereas the Mann-Whitney U test was used for ordinal data, and independent sample t-test for continuous data.

Simple binary logistic regression analysis was used to explore associations between the 10 specific domains of life satisfaction (explanatory variables) and overall life satisfaction (outcome variable), all coded as satisfied = 1 and dissatisfied = 0. To ensure that all models were based on the same participants listwise deletion, based on all explanatory variables, was used to handle missing data.

Binary logistic regression analyses were also used to explore the association between demographic and medical factors and overall life satisfaction. In the first step, simple logistic regression analyses were conducted with age, sex, place, aetiology, witnessed, initial rhythm, mechanical compressions, epinephrine, antiarrhythmics, intubation, percutaneous coronary intervention (PCI), coronary artery by-pass graft (CABG), target temperature management (TTM), internal converter device (ICD), time to CPR, time to defibrillation as explanatory variables, and PROM reported, and overall life satisfaction as outcome variable. In the second step, all demographic and medical factors were included simultaneously in a multiple binary logistic regression model. The Hosmer-Lemeshow test was used to assess goodness-of-fit in all multiple binary logistic regression models.²¹ Listwise deletion was used to handle missing data. In doing so, categorical variables with large missing data (> 50) were coded as unknown and added as dummy variables in the regression models, but they are not reported in the results.

The level of statistical significance was set at $p < 0.05$. All analyses were conducted using Stata 16 (StataCorp, College Station, TX, USA).

Results

Sample characteristics

When comparing included survivors ($n = 1435$) and non-respondents ($n = 2591$), there were some significant differences: heart disease as cause of CA (62.7% vs. 54.1%, $p < 0.001$), shockable initial rhythm (70.1% vs. 58.4%, $p < 0.001$), witnessed CA (92.4% vs. 90.0%,

$p = 0.009$), PCI treatment (41.8% vs. 28.6%, $p < 0.001$), and $CPC \leq 2$ (95.6% vs. 87.6%, $p < 0.001$). In contrast, there were no significant differences between respondents and non-respondents regarding age, sex, and place of CA (OHCA vs. IHCA).

Of the included survivors, 937 had suffered IHCA and 498 OHCA. The mean age was 65.9 (SD = 13.3) years, and the majority were male ($n = 1007$, 70.3%). OHCA survivors were significantly younger compared to IHCA survivors ($p < 0.001$). Heart disease was the most common cause of CA in both IHCA ($n = 545$, 62.9%) and OHCA ($n = 293$, 62.5%). Most survivors had a shockable initial rhythm ($n = 862$, 70.1%), which was significantly more common in OHCA compared to IHCA (88.9% vs. 60.1%, $p < 0.001$). At discharge, a majority of the survivors were reported to have CPC 1 ($n = 1106$, 84%) without any significant differences between IHCA and OHCA ($p = 0.273$). More information about the survivors is presented in Table 1.

Life satisfaction among CA survivors

In total, 60.5% of the survivors reported being satisfied with their overall life (Fig. 2). Regarding the specific domains, more than three quarters of the survivors reported being satisfied with their partner relations (85.6%), family life (82.2%), and self-care (77.8%). In contrast, less than half reported being satisfied with their sexual life (31.4%) and physical health (40.8%).

Associations between domains of life satisfaction

All specific domains were significantly associated with overall life satisfaction ($p < 0.001$) in the simple binary logistic regression analyses (Table 2). The strongest association was for psychological health (OR = 11.4, 95% CI = 8.3–15.7) and the weakest association was for economy (OR = 3.5, 95% CI = 2.6–4.7).

Factors associated with life satisfaction

Being male (OR = 1.8, 95% CI = 1.5–2.2), surviving OHCA (OR = 1.5, 95% CI = 1.2–1.8), having good cerebral performance (CPC 2, OR = 0.6, 95% CI = 0.4–0.8; CPC 3, OR = 0.4, 95% CI = 0.2–0.7), not receiving intubation (OR = 0.7, 95% CI = 0.5–0.9),

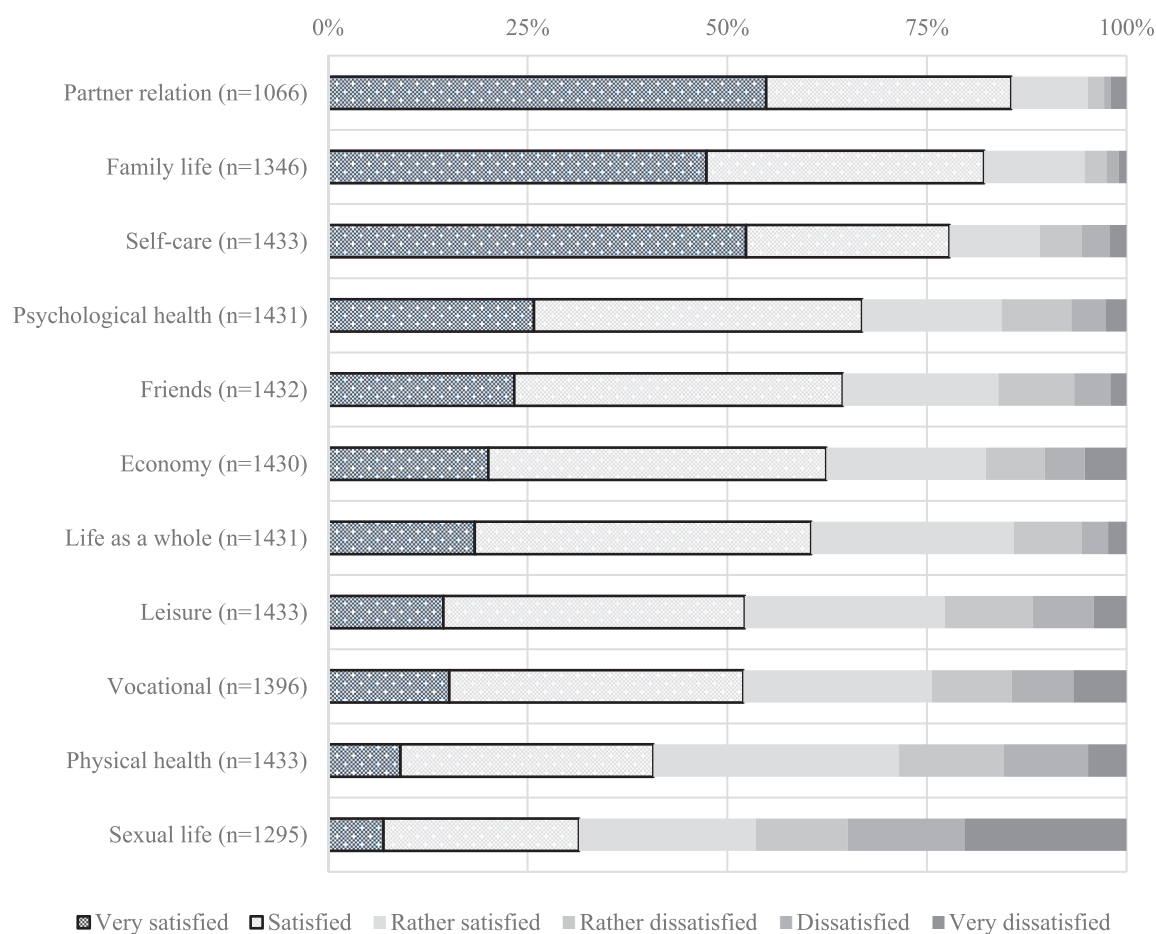


Fig. 2 – Reported domains and ranking of LiSat-11. Framed bars represent the share of survivors that were satisfied according to recommended cut-off scores.

Table 2 – Associations between the specific domains in LiSat-11 and overall life satisfaction, based on simple binary logistic regression analyses (n = 961).^a

Explanatory variables ^b	OR	95% CI for OR	p-value
Psychological health	11.4	8.3–15.7	< 0.001
Leisure	9.8	7.2–13.4	< 0.001
Family life	9.6	6.2–14.9	< 0.001
Vocation	9.5	7.0–13.1	< 0.001
Physical health	7.3	5.2–10.2	< 0.001
Partner relation	6.6	4.4–10.0	< 0.001
Self-care	6.3	4.3–9.1	< 0.001
Friends	6.2	4.7–8.3	< 0.001
Sexual life	5.4	3.7–7.7	< 0.001
Economy	3.5	2.6–4.7	< 0.001

LiSat-11, the 11-item Life Satisfaction questionnaire; OR, odds ratio; CI, confidence interval.

^a Non-parametric bootstrapped confidence intervals and p-values for odds ratio (OR). The logistic regression models were based on dichotomized LiSat-11 scores (dissatisfied = 0; satisfied = 1).

^b Presented in descending order by strength of association (OR).

9), and being treated with PCI (OR = 1.3, 95% CI = 1.0–1.6) were significantly associated with being satisfied with overall life in the simple logistic regression analyses (Table 3).

In the multiple logistic regression analysis, being male (OR = 1.7, 95% CI = 1.3–2.1), having good cerebral performance (CPC 2, OR = 0.6, 95% CI = 0.4–0.9; CPC 3, OR = 0.4, 95% CI = 0.2–0.8),

Table 3 – Factors associated with overall life satisfaction, based on binary logistic regression analyses (n = 1406).^{a,b}

Explanatory variables	Simple binary logistic regression			Multiple binary logistic regression		
	OR	95% CI for OR	p-value	OR	95% CI for OR	p-value
Sex, male	1.8	1.5–2.2	< 0.001	1.7	1.3–2.1	< 0.001
Out of Hospital Cardiac Arrest (OHCA)	1.5	1.2–1.8	0.001	1.3	0.9–1.8	0.132
Cerebral Performance Category (CPC)						
CPC 1	[Reference]			[Reference]		
CPC 2	0.6	0.4–0.8	0.001	0.6	0.4–0.9	0.006
CPC 3	0.4	0.2–0.7	0.001	0.4	0.2–0.8	0.012
Intubation	0.7	0.5–0.9	0.004	0.8	0.6–1.2	0.315
Percutaneous Coronary Intervention (PCI)	1.3	1.0–1.6	0.018	1.0	0.7–1.3	0.828
Shockable rhythm	1.1	0.9–1.4	0.368	0.6	0.4–1.0	0.049
Age	1.0	1.0–1.0	0.158	1.0	1.0–1.0	0.156
Witnessed cardiac arrest	1.1	0.3–1.6	0.654	1.1	0.7–1.7	0.719
Heart disease	1.2	1.0–1.5	0.074	1.0	0.8–1.4	0.940
Epinephrine	0.9	0.7–1.1	0.271	0.9	0.6–1.2	0.436
Antiarrhythmics	1.0	0.8–1.4	0.779	1.2	0.8–1.6	0.387
Mechanical compressions	1.2	0.9–1.6	0.209	1.1	0.8–1.6	0.586
Targeted Temperature Management (TTM)	1.0	0.7–1.3	0.720	0.9	0.6–1.4	0.691
Coronary Artery Bypass Graft (CABG)	1.4	0.7–2.8	0.319	1.2	0.6–2.4	0.688
Implantable Cardioverter Defibrillator (ICD)	0.9	0.7–1.2	0.491	0.8	0.5–1.1	0.110
Time to CPR < 1 min	0.7	0.5–1.0	0.084	1.1	0.7–1.7	0.626
Time CA to Defibrillation < 5 min	0.8	0.6–1.0	0.074	0.7	0.5–1.2	0.211
PROM reported ≤ 180 days	1.2	0.9–1.5	0.148	1.2	0.9–1.5	0.269

CPR; Cardiopulmonary Resuscitation, PROM; Patient Related Outcome Measure.

^a Non-parametric bootstrapped confidence intervals and p-values for odds ratio (OR). The logistic regression models were based on dichotomized LiSat-11 scores (dissatisfied = 0; satisfied = 1).

^b Hosmer-Lemeshow goodness-of-fit for the multiple binary logistic regression model: $\chi^2(8) = 2.85$, $p = 0.943$.

and not having shockable initial rhythm (OR = 0.6, 95% CI = 0.4–1.0) were significantly associated with being satisfied with overall life (Table 3).

Discussion

To the best of our knowledge, this is the largest study to date exploring life satisfaction in CA survivors. In general, survivors were satisfied with their overall life. Satisfaction with psychological health was the most important domain for overall life satisfaction. Among demographic and medical factors, male sex, good cerebral performance, and non-shockable rhythm were associated with higher levels of overall life satisfaction.

The finding that CA survivors generally report satisfaction with overall life diverges from a study by Lundgren-Nilsson et al.¹⁵ which showed that only one fifth of the CA survivors were satisfied. This difference is difficult to explain given that the samples in the two studies were both Swedish and included participants of similar ages but may be related to the sample size and time for follow up (1 year vs. 3–6 months). Similarly, in agreement with our findings, Wallin et al. reported that 70% of their sample expressed satisfaction with their lives.¹⁶ Interestingly, this is also in agreement with a Swedish population-based study among adults between 18–64 years of age, where approximately 70% reported that they were satisfied with their life as a whole.¹⁸ Thus, according to the LiSat-11, CA survivors seem to have similar levels of life satisfaction as the general Swedish population.

While the CA survivors reported to be satisfied with their overall life, about two thirds reported to be dissatisfied with their sexual life. This is consistent with Wallin et al. and Lundgren-Nilsson et al.,^{15–16} who found that CA survivors were less satisfied with their sexual life compared to the other LiSat-11 dimensions. Compared to the general population study by Fugl-Meyr et al. showing that 56% were satisfied with their sexual life,¹⁸ the CA survivors appear to be significantly less satisfied. One possible explanation could be that the study by Fugl-Meyr et al. included a younger sample compared to the CA studies. However, the share of partner relationships was similar between the present study and the study by Fugl-Meyr et al. Another possible explanation may be that CA survivors suffer from other co-morbidities such as cardiovascular disease, which is the most common cause of CA and is known to impact the sexual life among both females and males.²² For example, sexual dysfunction is more common among females with hypertension than among those without,^{23,24} and betablockers can impair male sexual function.²⁵ Fear, in both survivors and their partners, of suffering another CA or other cardiac complications during sexual activity could also be a possible explanation for the dissatisfaction with sexual life. For example, previous studies have indicated fear of sexual activity after a myocardial infarction.^{26,27} Except for the LiSat-11, sexuality is not routinely followed up in the registry. Our observations suggest that there may be a need for more attention to this subject during follow up.

Psychological health was the domain of life satisfaction most strongly associated with overall life satisfaction. This was also one of the domains that CA survivors reported to be most satisfied with

in the present study. Previous research has shown that psychological distress such as anxiety and depression is common among CA survivors.^{7,28} In a Dutch study focusing on long term outcomes, anxiety and depression was reported in over 40% of CA survivors, while severe problems were reported as unusual.²⁹ However, two large Swedish studies have not found any major differences in symptoms of anxiety and depression among CA survivors compared to a general population.^{1,30} In fact, the study by Årestedt et al. showed that older CA survivors reported significantly less symptoms of anxiety and depression compared to a gender and age matched general population. However, that study included only older survivors, 65–80 years.³⁰ In any case, since there seems to be a clear association between psychological health and overall life satisfaction, it is important to screen CA survivors for psychological health problems to identify those in need of psychological support and treatment, which is also recommended in current ERC guidelines.³¹

Being female was associated with lower levels of overall life satisfaction. Similar findings regarding gender differences were found by Wallin et al. showing that females reported lower levels of satisfaction with psychological health compared with males.¹⁶ In contrast, in the Swedish general population-based study including a large random sample of adult females and males, females reported higher levels of satisfaction with self-care and friends than males.¹⁸ In addition, other CA studies have pointed out that females report poorer health and quality of life than males.^{32,33} Therefore, sex differences may be an important aspect when studying life after CA, regardless of outcome.

In addition to sex, neurological outcome and initial rhythm represented other factors associated with overall life satisfaction. As can be expected, poorer neurological outcome (as implied by higher CPC scores) was significantly associated with lower levels of life satisfaction. Similar results have been described by Larsson et al.,³⁴ showing that poorer neurological outcome was associated with poorer perceived health among adult CA survivors. A more unexpected finding was shown for initial rhythm: having a non-shockable initial rhythm was significantly associated with higher levels of overall life satisfaction. However, previous studies have shown that a non-shockable rhythm is associated with poorer HRQoL.³⁵ One possible explanation might be that CA survivors with a non-shockable rhythm have had a more complicated disease trajectory and therefore re-evaluated their life-preferences in a different way compared to CA survivors with a less complicated disease trajectory. This interpretation is supported by other studies showing that persons who have survived a life-threatening illness often experience a gratitude towards being alive.³⁶ However, it should be noted that the p-value was close to the 5% significance level. In addition, the present study was based on cross-sectional data where no causal conclusions can be drawn. Therefore, prospective studies are needed to further investigate these associations and longitudinal variations in life satisfaction.

Finally, life satisfaction seems to be an important outcome in CA survivors and can be a useful complement to PROMs that focus on HRQoL. In addition to the overall domain, LiSat-11 covers 10 specific domains of life satisfaction that all are of potential importance for CA survivors, but not covered by recommended instruments such as the EQ-5D, SF-36, and HADS,^{31,37} e.g., sexual life, family life, and partner relationship.

Limitations

This study has some limitations. Information about co-morbidity was missing since it is only reported in the IHCA part of the SRCR. A large proportion of survivors did not participate in the registry follow up and there were differences between respondents and non-respondents, indicating that those with more complicated CA trajectories (e.g., those with non-shockable initial rhythm, not witnessed, and poor CPC scores) did not participate to the same extent as others. In addition, survivors with the poorest neurological outcome, i.e., CPC > 3, were not included since completing a self-report questionnaire may be prohibited in the presence of more severely impaired neurological function. This may compromise generalizability of the results to survivors with poor neurological outcome, a common problem in CA research. Finally, listwise deletion was used to handle missing data in the regression analyses, which can cause biased estimates. This problem was most evident in the regression analysis exploring the association between the 10 specific domains of life satisfaction and overall life satisfaction. However, in the regression analyses exploring the associations between demographic and medical factors and overall life satisfaction, only 29 of 1435 observations were dropped due to the listwise deletion.

Conclusions

Overall, CA survivors seem to perceive similar levels of overall life satisfaction as general populations, while survivors tend to be significantly less satisfied with their sexual life. Satisfaction with psychological health was most strongly associated with overall life satisfaction and is therefore of special interest to identify and treat in CA survivors. Additionally, females and survivors with poor neurological outcome tend to be most vulnerable for poor overall life satisfaction and therefore need special attention by health care professionals. The LiSat-11 instrument seems to capture important domains to address in the clinical follow-up.

CRedit authorship contribution statement

Stefan Aregger Lundh: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Validation, Visualization, Writing – original draft, Writing – review & editing. **Johan Israelsson:** Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing. **Peter Hagell:** Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing. **Petra Lilja Andersson:** Conceptualization, Investigation, Methodology, Supervision, Writing – review & editing. **Kristofer Årestedt:** Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Supervision, Validation, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Author details

^aThe PRO-CARE Group, Faculty of Health Sciences, Kristianstad University, Kristianstad, Sweden

^bFaculty of Health and Life Sciences, Linnaeus University, Kalmar, Sweden

^cDepartment of Internal Medicine, Division of Cardiology, Region Kalmar County, Kalmar, Sweden ^dDepartment of Research, Region Kalmar County, Kalmar, Sweden

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