ORIGINAL ARTICLE

Family Presence during Cardiopulmonary Resuscitation

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ABSTRACT

BACKGROUND

The effect of family presence during cardiopulmonary resuscitation (CPR) on the family members themselves and the medical team remains controversial.

METHODS

We enrolled 570 relatives of patients who were in cardiac arrest and were given CPR by 15 prehospital emergency medical service units. The units were randomly assigned either to systematically offer the family member the opportunity to observe CPR (intervention group) or to follow standard practice regarding family presence (control group). The primary end point was the proportion of relatives with post-traumatic stress disorder (PTSD)–related symptoms on day 90. Secondary end points included the presence of anxiety and depression symptoms and the effect of family presence on medical efforts at resuscitation, the well-being of the health care team, and the occurrence of medicolegal claims.

RESULTS

In the intervention group, 211 of 266 relatives (79%) witnessed CPR, as compared with 131 of 304 relatives (43%) in the control group. In the intention-to-treat analysis, the frequency of PTSD-related symptoms was significantly higher in the control group than in the intervention group (adjusted odds ratio, 1.7; 95% confidence interval [CI], 1.2 to 2.5; P=0.004) and among family members who did not witness CPR than among those who did (adjusted odds ratio, 1.6; 95% CI, 1.1 to 2.5; P=0.02). Relatives who did not witness CPR had symptoms of anxiety and depression more frequently than those who did witness CPR. Family-witnessed CPR did not affect resuscitation characteristics, patient survival, or the level of emotional stress in the medical team and did not result in medicolegal claims.

CONCLUSIONS

Family presence during CPR was associated with positive results on psychological variables and did not interfere with medical efforts, increase stress in the health care team, or result in medicolegal conflicts. (Funded by Programme Hospitalier de Recherche Clinique 2008 of the French Ministry of Health; ClinicalTrials.gov number, NCT01009606.)

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Cardiac arrest accounts for 600,000 deaths annually in industrialized countries.[1,2] Family members who are present at the time of attempted resuscitation are at high risk for emotional and physical burdens.[3]

Being present during cardiopulmonary resuscitation (CPR) may help the family member understand that everything possible to bring the patient back to life has been implemented.[4,5] In addition to quelling suspicion about behind-closed-doors resuscitation efforts and unrealistic expectations of such efforts, the family member's presence may offer the opportunity for a last goodbye and help that person grasp the reality of death, with the hope that the bereavement process will not be prolonged or complicated by pathologic mourning or post-traumatic stress disorder (PTSD). Yet the benefits and drawbacks of family presence during resuscitation have been argued since it was proposed in 1987.[4,6,7] Indeed, the potential benefits must be weighed against the possibility of stress induced in health care providers and an increase in the emotional burden on family members, as well as the risk of legal claims.[5,6,8]

The evaluation of the psychological effects of family observation of resuscitation has so far come mostly from simple feedback or small observational studies.[4,5,9] The only randomized, prospective evaluation of family presence during CPR to date was terminated after enrollment of only 25 patients. Clinical teams had become so convinced of the benefits to relatives that investigators feared the randomization process would be intentionally compromised by staff.[10] This premature interruption left the question unresolved for many, with the intervention remaining a matter of controversy. Despite these debates about benefits and harms, major international guidelines for CPR state that available evidence supports family-witnessed resuscitation, and this action is considered reasonable and generally useful.[7,11,12]

We designed a multicenter, randomized, controlled trial of family presence during resuscitation. The principal aim of this trial was to determine whether offering a relative the choice of observing CPR might reduce the likelihood of PTSD-related symptoms. We also assessed the effect of family presence on medical efforts at resuscitation, the well-being of the health care team, and the occurrence of medicolegal claims.

METHODS

STUDY DESIGN, PARTICIPANT SELECTION, AND STUDY PROCEDURES

This study was a prospective, cluster-randomized, controlled trial. Fifteen prehospital emergency medical service units (Service d'Aide Médicale d'Urgence) in France participated in the study from November 2009 through October 2011. These units are ambulance base stations equipped with one or more mobile intensive care units, consisting of an ambulance driver, a nurse, and a senior emergency physician as the minimum team.[13] Simple randomization procedures were used to assign eight of the participating units to the intervention and seven to the control.

We included adult family members of adult patients in cardiac arrest occurring at home. We evaluated only one first-degree relative per patient. The relative was chosen in accordance with the legislation on hospitalization at the request of a third party in the following order of preference: spouse, parent, offspring, sibling. Exclusion criteria were communication barriers with the relative and cardiac-arrest cases in which resuscitation was not attempted.

For emergency medical service units assigned to the intervention, a medical team member systematically asked family members whether they wished to be present during the resuscitation. A communication guide (see Table S1 in the Supplementary Appendix, available with the full text of this article at NEJM.org) that was developed from published guidelines was available to help introduce the relative to the resuscitation scene and, when required, to help with the announcement of the death.[5,14,15] For units assigned to the control, family members were not routinely given the option to be present during CPR; instead, the physician team leaders interacted with these family members in a standard manner during CPR. Relatives who chose to witness the resuscitation were taken to the room where it was being performed. Relatives who chose not to witness the resuscitation were taken to another room of the home or were taken outside the home if the space inside was insufficient.

The study was approved by the institutional review board (Comité de Protection des Personnes Ile-de-France 10). In accordance with French law, the board waived the requirement for obtaining informed consent from patients because of the

emergency setting of the research; however, deferred consent of the family members was required. All the relatives participating in the study provided written informed consent before the departure of the health care team from the home. The first, next-to-last, and last authors assume responsibility for the completeness and accuracy of the data and analyses and for the fidelity of the study to the protocol, which is available at NEJM.org.

FOLLOW-UP AND PSYCHOLOGICAL ASSESSMENT OF FAMILY MEMBERS

Ninety days after resuscitation, a trained psychologist who was unaware of the study-group assignments asked enrolled relatives to answer a structured questionnaire by telephone. The interviewer asked relatives to complete the Impact of Event Scale (IES) and the Hospital Anxiety and Depression Scale (HADS).[16,17] A relative was deemed unreachable after 15 telephone calls had gone unanswered.

The IES has been widely used for many years and is reliable across a broad range of traumatic events.[18] Each of the 15 items is scored on a scale from 0 to 5, so the total score ranges from 0 (no PTSD-related symptoms) to 75 (severe PTSD-related symptoms).[19] The HADS is made up of two subscales, one evaluating symptoms of anxiety ($HADS_A$, seven items) and the other assessing symptoms of depression ($HADS_D$, seven items).[17] Subscale scores range from 0 (no distress) to 21 (maximum distress). HADS subscale scores higher than 10 indicate moderate-to-severe symptoms of anxiety or depression.[10,20] The satisfaction of the relatives at having been absent or present was also recorded.

The primary end point was the proportion of relatives with PTSD-related symptoms (as indicated by an IES score higher than 30) on day 90, in agreement with previous reports.[15,18]

SECONDARY ANALYSES

Secondary end points included the effect of family presence on medical efforts at resuscitation, the well-being of the health care team, and the occurrence of medicolegal claims. Demographic and clinical data for the resuscitated patients were recorded according to the Utstein style.[21] A series of items reflecting the relative's behaviors and the type of invasive procedures witnessed by the relative during CPR was recorded. The level of emotional stress in the medical team was evaluated after each resuscitation with the use of a visual-analogue scale and a nine-item questionnaire adapted from the literature review.[22] Once the recruitment was completed, the principal investigator asked all center investigators to report medicolegal claims, complaints, and words of thanks.

STATISTICAL ANALYSIS

Assumptions for sample-size calculation were based on the study by Azoulay et al.[18] In that study, 28 family members of patients who died in the intensive care unit (50%) had an IES score higher than 30 at 90 days.[18] On the basis of this expected percentage, a sample of 340 relatives for whom data could be analyzed was required to provide 80% power to detect a 15% difference between the two groups, with a two-sided type I error rate of 0.05 in the case of independent statistical units. Because of the cluster randomization, the final sample required was 460 relatives for whom data could be analyzed.

The main analysis of the primary end point was based on the intention-to-treat population (i.e., all randomly assigned patients). For this main analysis, we classified participants who did not complete the IES assessment because of emotional distress as having PTSD-related symptoms, and we used multiple imputation for the other participants with missing data.[23] Prespecified additional analyses according to family-presence status and two sensitivity analyses for IES score were performed. First, we restricted the analysis to the participants who completed the IES assessment (observed-cases population). Second, we restricted the analysis to family members whose relatives were deceased at day 28. No interim analysis was performed.

Data are reported as means (±SD) or medians and interquartile ranges for continuous variables and as percentages for categorical variables. Univariate associations were evaluated with the use of Student's t-test or the Wilcoxon signed-rank test for continuous data and the chi-square test or Fisher's exact test, as appropriate, for categorical data. For psychological-assessment analyses, generalized estimating equations were used for categorical data, and a mixed-model analysis of variance was used for continuous data, with study center as a random effect and adjustment for the relative's relationship to the patient. When

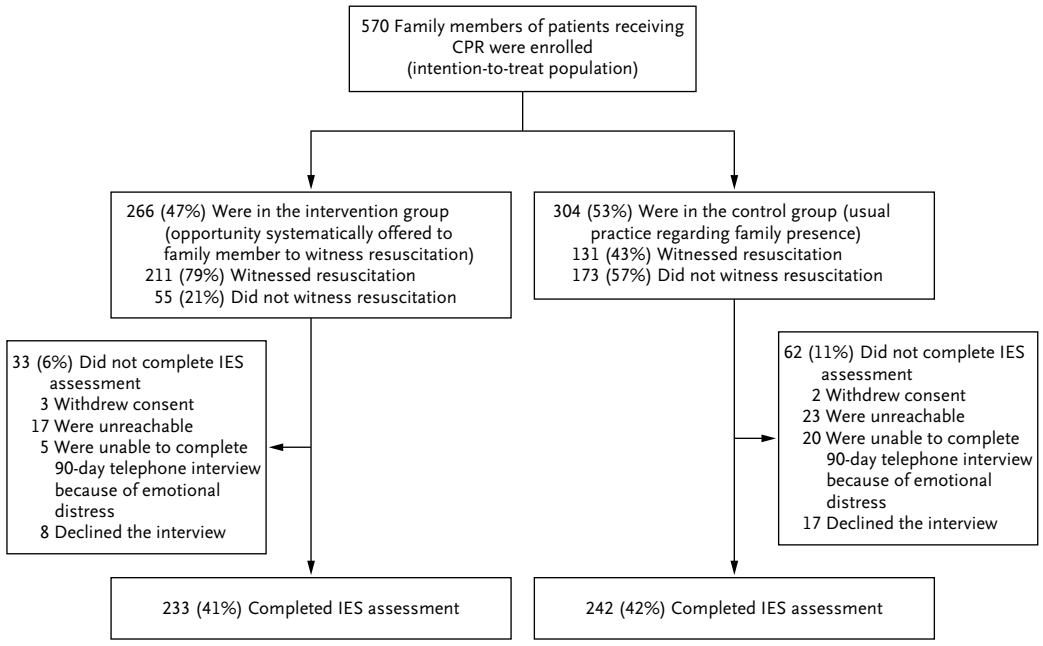

Figure 1. Randomization and Follow-up.

The Impact of Event Scale (IES) was used to assess symptoms related to post-traumatic stress disorder (PTSD); scores range from 0 (no PTSD-related symptoms) to 75 (severe PTSD-related symptoms). CPR denotes cardiopulmonary resuscitation.

necessary, normalizing transformations were performed. All statistical tests were two-tailed, with a type I error rate of 0.05. A P value of less than 0.05 was considered to indicate statistical significance. Statistical tests were performed with the use of SAS software, version 9.2 (SAS Institute).

RESULTS

CHARACTERISTICS OF PATIENTS AND ENROLLED FAMILY MEMBERS

A total of 570 family members (intention-to-treat population) were enrolled in the study: 266 were systematically given the option of being present during CPR (intervention group) and 304 were not routinely asked whether they wanted to be present (control group) (Fig. 1). In total, 342 family members (60%) witnessed resuscitation and 228 did not.

At 90 days, 95 family members (17%) did not complete the IES assessment; therefore, 475 (observed-cases population) were included in the sensitivity analysis (Fig. 1). The proportion of family members who were unable to complete the 90-day telephone interview because of emotional distress was significantly greater in the control group than in the intervention group (P=0.007) (Fig. 1). The characteristics of patients and family members at the time of enrollment did not differ significantly between the two study groups (Table 1).

RESUSCITATION CHARACTERISTICS AND OUTCOMES

Twenty patients (4%) were still alive at day 28. Characteristics of the resuscitation procedure, survival to hospital admission, and survival to day 28 did not differ significantly between the intervention group and the control group (data not shown). Survival, the duration of advanced resuscitation, the type or dose of infused medications, and the number of shocks delivered were not affected by the presence or absence of the family member (Table 2).

PSYCHOLOGICAL ASSESSMENT

Main Criterion

In the intention-to-treat population (570 family members), the frequency of PTSD-related symp-

toms was significantly higher in the control group than in the intervention group (adjusted odds ratio, 1.7; 95% confidence interval [CI], 1.2 to 2.5; P=0.004) and was significantly higher among family members who did not witness CPR than among those who did (adjusted odds ratio, 1.6; 95% CI, 1.1 to 2.5; P=0.02). The results were similar for an analysis that was restricted to the observed-cases population (P=0.01 for both comparisons) (Table 3) and an analysis that excluded the 20 resuscitated patients who were alive at day 28 (P=0.009 for both comparisons).

Table 1. Characteristics of Patients, Enrolled Family Members, and Cardiac Arrest.*

Characteristic	Intervention Group (N=266)	Control Group (N=304)
Patients		
Age — yr	69±15	67±15
Male sex — no. (%)	180 (68)	200 (66)
Coexisting conditions — no. (%)		
Chronic obstructive pulmonary disease	42 (16)	48 (16)
Chronic heart failure	72 (27)	69 (23)
Cancer	37 (14)	32 (11)
Psychiatric disorder, excluding depression	8 (3)	6 (2)
Depression	21 (8)	37 (12)
Chronic renal failure	12 (5)	7 (2)
Neurologic disorder	23 (9)	21 (7)
Activity limitation — no./total no. (%)†		
A	107/266 (40)	113/302 (37)
B	93/266 (35)	94/302 (31)
C	45/266 (17)	73/302 (24)
D	21/266 (8)	22/302 (7)
Family members		
Age — yr	57±16	57±16
Male sex — no. (%)	93 (35)	114 (38)
Relationship to patient — no./total no. (%)		
Partner, husband, or wife	146/264 (55)	170/302 (56)
Child	92/264 (35)	107/302 (35)
Parent	12/264 (5)	10/302 (3)
Sibling	14/264 (5)	15/302 (5)
Religion — no./total no. (%)‡		
Catholic	131/231 (57)	140/241 (58)
Protestant	4/231 (2)	1/241 (0)
Jewish	5/231 (2)	2/241 (1)
Muslim	22/231 (10)	11/241 (5)
Other	5/231 (2)	3/241 (1)
No religion	64/231 (28)	84/241 (35)
Marital status — no./total no. (%)‡		
Married or common-law married	63/232 (27)	66/241 (27)
Widowed	116/232 (50)	122/241 (51)
Single	53/232 (23)	53/241 (22)

Table 1. °(Continued.)

Characteristic	Intervention Group (N=266)	Control Group (N=304)
Work status — no./total no. (%)‡		
Farmer	3/233 (1)	4/242 (2)
Employee, worker	97/233 (42)	102/242 (42)
Executive, manager	4/233 (2)	8/242 (3)
Professional	43/233 (18)	24/242 (10)
Unemployed	11/233 (5)	14/242 (6)
Retired	67/233 (29)	79/242 (33)
Other	8/233 (3)	11/242 (5)
Past bereavements — no./total no. (%)‡	198/232 (85)	220/242 (91)
History of psychiatric disorders — no./total no. (%)‡	41/231 (18)	40/242 (17)
Cardiac arrest		
Family member witnessed arrest — no. (%)	200 (75)	218 (72)
Family member who witnessed arrest performed CPR — no. (%)§	41 (20)	44 (20)
Particular circumstance of cardiac arrest — no. (%)		
Trauma	31 (12)	47 (15)
Suicide	8 (3)	13 (4)
Expected death	19 (7)	24 (8)
Initial cardiac rhythm — no. (%)		
Ventricular fibrillation	27 (10)	40 (13)
Pulseless electrical activity	21 (8)	23 (8)
Asystole	218 (82)	241 (79)
Time from collapse to arrival of first responders — min§		
Median	9	10
Interquartile range	3–14	3–15
Time from collapse to first defibrillation shock — min§		
Median	15	18
Interquartile range	8–25	12–30
Time from collapse to start of advanced resuscitation — min§		
Median	23	23
Interquartile range	15–30	15–30

* Plus–minus values are means ±SD. P>0.05 for all between-group comparisons. CPR denotes cardiopulmonary resuscitation.
† Activity levels were defined as follows (according to the Knaus chronic health status score): A, previous good health, no functional limitations; B, mild-to-moderate limitation of activity because of a chronic medical problem; C, chronic disease causing serious but not incapacitating limitation of activity; and D, severe restriction of activity due to disease, including being bedridden or institutionalized because of illness.[24]
‡ These data are from the evaluation at 90 days (233 family members in the intervention group and 242 family members in the control group).
§ These data pertain to arrests witnessed by a family member (200 arrests in the intervention group and 218 arrests in the control group).

Secondary Criteria

Analyses of psychological variables in the observed-cases population (475 persons) according to study group and family-presence status are reported in Table 3. The frequency of symptoms of anxiety was significantly higher in the control group than in the intervention group and was also significantly higher among family members who did not witness resuscitation than among those who did (P<0.001 for both comparisons).

Table 2. Characteristics and Outcome of Advanced Resuscitation According to the Presence or Absence of a Family Member.

Characteristic or Outcome	Family Member Present (N=342)	Family Member Absent (N=228)	P Value
Resuscitation procedure			
Duration of advanced resuscitation — min			0.58
Median	30	30	
Interquartile range	23–40	20–40	
No. of shocks delivered — median (interquartile range)	3 (1–5)	4 (1–6)	0.56
Epinephrine administration — mg			0.86
Median	7	7	
Interquartile range	5–10	5–10	
Additional drugs administered — no. (%)			
Amiodarone	44 (13)	29 (13)	0.96
Fibrinolytic drug	7 (2)	10 (4)	0.11
Lidocaine	0	1 (0)	0.40
Sodium bicarbonate	21 (6)	10 (4)	0.37
Other	26 (8)	13 (6)	0.38
Survival			
Return of spontaneous circulation — no. (%)	94 (27)	58 (25)	0.59
Survival to hospital admission — no. (%)	63 (18)	36 (16)	0.42
Survival to day 28 — no. (%)	11 (3)	9 (4)	0.64

The proportion of family members with symptoms of depression did not differ significantly between the control and intervention groups (P=0.13) but was significantly lower among family members who were present than among those who were absent (P=0.009).

INTERFERENCE BY FAMILY MEMBERS

Data on the behaviors of family members and the invasive procedures that they witnessed during the resuscitation are presented in Table S2 in the Supplementary Appendix. Very few family members (<1%) were aggressive or in conflict with the medical team. Twenty-two of the 186 family members who did not witness CPR (12%) expressed regret at having been absent, as compared with 9 of 289 relatives who witnessed CPR (3%) and who regretted being present (P<0.001).

STRESS ASSESSMENT OF MEDICAL TEAMS

The median stress level as measured on the visual-analogue scale was 5 out of 100 (interquartile range, 0 to 15) among 1710 health care professionals evaluated. We found no significant differences in stress levels according to family-presence status (Table 4).

MEDICOLEGAL CONFLICTS

With a mean follow-up of 20±5 months, there were no claims for damages from any participating family members nor were there any medicolegal conflicts. We received one thank-you letter from a relative in the control group who observed CPR.

DISCUSSION

In this multicenter, randomized trial, offering family members of patients undergoing CPR the option of witnessing the resuscitation efforts was associated with a significantly lower incidence of PTSD-related symptoms than was following standard practice regarding family presence. Irrespective of whether the family members were offered the choice, more favorable results of psychological testing were noted when family members were present.

Table 3. Psychological Assessment of Family Members Enrolled in the Study at 90 Days (Observed-Cases Population).*

Variable	Intervention Group (N=233)	Control Group (N=242)	P Value†	Family Member Present (N=289)	Family Member Absent (N=186)	P Value†
IES score — median (interquartile range)‡	22 (12–33)	24 (13–35)	0.26	21 (11–32)	26 (15–36)	0.007
Presence of PTSD-related symptoms — no. (%)§	64 (27)	90 (37)	0.01	78 (27)	76 (41)	0.01
HADS score — median (interquartile range)¶	10 (6–16)	11 (6–19)	0.44	9 (5–16)	12 (7–19)	0.02
Symptoms of anxiety — no./total no. (%)‖	34/230 (15)	55/239 (23)	<0.001	46/287 (16)	43/182 (24)	<0.001
Symptoms of depression — no./total no. (%)‖	39/230 (17)	50/239 (21)	0.13	42/287 (15)	47/182 (26)	0.009
Saw a psychologist after resuscitation of the patient — no./total no. (%)	20/232 (9)	18/242 (7)	0.83	25/289 (9)	13/185 (7)	0.23
Received newly prescribed psychotropic drugs after resuscitation of the patient — no./total no. (%)	64/230 (28)	77/238 (32)	0.22	72/287 (25)	69/181 (38)	<0.001
Made a suicide attempt after resuscitation of the patient — no./total no. (%)	2/227 (1)	3/238 (1)	—	5/285 (2)	0/180	—

* PTSD denotes post-traumatic stress disorder.
† P values were calculated with the use of generalized estimating equations for categorical variables and mixed-model analysis of variance for continuous variables, with emergency medical services unit as a random effect and the relative's relationship to the patient as a fixed effect.
‡ Scores on the Impact of Event Scale (IES) range from 0 (no PTSD-related symptoms) to 75 (severe PTSD-related symptoms).
§ The presence of PTSD-related symptoms was defined by an IES score higher than 30.
¶ Scores on the Hospital Anxiety and Depression Scale (HADS) range from 0 to 42, with higher scores indicating greater anxiety and depression.
‖ Symptoms of anxiety or depression were defined by a HADS subscale score higher than 10 (range, 0 to 21).

Routinely offering family members the opportunity to stay with the patient during CPR remains a controversial issue.[6] Observational and qualitative studies have favored family presence during CPR.[4,5,9,25] In a recent study that involved 65 family members of patients undergoing CPR, there were no significant differences in overall PTSD or depression scores between those who witnessed CPR and those who did not.[23] However, this study was small and did not have a randomized design, thus limiting the conclusions that can be drawn from the results. The same authors conducted another small, nonrandomized study and found that witnessing a failed CPR attempt on a loved one was associated with an increase in PTSD symptoms.[8]

We found that the effectiveness of resuscitation was not affected by the presence of a family member, nor was the duration of CPR, the selection of drugs, or the survival rate. These results are in contrast with the findings of two large surveys that revealed concerns about family interference with CPR.[26,27] However, our results are in agreement with those of two studies involving resuscitation of children with trauma.[22,28] Another study attempted to determine whether family presence influenced critical actions performed by physicians during CPR, when simulated on a mannequin.[29] In this virtual clinical study, the time required to deliver the first defibrillation was significantly longer and the number of shocks was significantly smaller when a family member displayed aggressive reactions. Our results in real patients did not confirm the results of this simulation. In fact, very few family members (<1%) were aggressive or in conflict with the medical team. This observation was consistent with the results of two comparative studies that evaluated the effect of family presence on the efficiency of resuscitation efforts for children with trauma.[22,28]

Stress levels in the health care team were not affected by family presence during resuscitation. Our results are at odds with those of a similar evaluation involving emergency room staff members in 1987.[4] In this pivotal study, 30% of the 20 staff members reported that they had been hampered in their activities, mainly by anxiety about being observed or by concern about possible emotional or disruptive behavior on the part of family members.[4]

Many medical team members are reluctant to permit the presence of family members during

resuscitation because of fear of medicolegal conflicts. In a survey of 592 health professionals, 24% of 432 respondents who disapproved of the presence of family members listed medicolegal concerns as an explanation.[27] We encountered no damage claims from families in this study, nor any lawsuits. Although our sample size is small and the medicolegal culture may be different in France than elsewhere, our findings should help allay physicians' medicolegal concerns.

The limitations of the current study need to be considered. First, this study was conducted in France. Although this fact may preclude generalizing the findings to other emergency medical systems, many studies evaluating this question in other settings have reported results in agreement with those of our study, supporting their generalizability.[4,9,14,28] Second, not all patients included in the study died. Given that PTSD symptoms are related to post-traumatic grief, it might be expected that the effect of being present during CPR would differ according to patient outcomes.[30] However, we conducted a sensitivity analysis that excluded the 20 survivors at day 28. The results did not differ from those of the original analysis. Third, we included in this study relatives with various relationships to the patient. One might argue that the option of being present during CPR should be offered only to very close relatives, such as spouses. However,

Table 4. Evaluation of Stress in the Medical Team (N=570).*

Variable	Family Member Present (N=342)	Family Member Absent (N=228)	P Value
Score for stress on VAS — median (interquartile range)			
Emergency physician	8.5 (0–20)	10 (0–20)	0.38
Nurse	5 (0–15)	5 (0–15)	0.74
Ambulance driver	0 (0–15)	0 (0–10)	0.71
Questionnaire responses — % answering true/false/ I don't know			
I felt stressed			
Emergency physician	10/87/3	9/88/3	0.76
Nurse	7/86/7	7/88/5	0.57
Ambulance driver	8/86/6	5/87/8	0.36
I was able to easily communicate with my colleagues			
Emergency physician	97/2/1	98/1/1	0.64
Nurse	95/2/3	96/1/3	0.63
Ambulance driver	92/2/6	93/1/6	0.54
I felt the way I usually do			
Emergency physician	90/7/3	90/6/4	0.52
Nurse	91/5/4	92/3/5	0.62
Ambulance driver	85/6/9	90/3/7	0.28
I was disturbed by my thoughts about the distress of the patient's relative			
Emergency physician	12/82/6	10/85/5	0.66
Nurse	12/81/7	16/74/10	0.13
Ambulance driver	16/75/9	10/78/12	0.10
I was unable to concentrate because of what was going on around me			
Emergency physician	4/94/2	2/97/1	0.37
Nurse	2/95/3	2/94/4	0.86
Ambulance driver	3/91/6	2/92/6	0.86

Table 4. (Continued.)

Variable	Family Member Present (N=342)	Family Member Absent (N=228)	P Value
I was afraid of committing a medicolegal error			
Emergency physician	2/96/2	1/96/3	0.32
Nurse	2/93/5	0/95/5	0.42
Ambulance driver	2/88/10	3/89/8	0.85
I felt panic			
Emergency physician	1/98/1	1/98/1	0.71
Nurse	0/96/4	0/97/3	0.68
Ambulance driver	1/93/6	1/93/6	1.00
I was able to handle the situation			
Emergency physician	84/2/14	87/1/12	0.73
Nurse	82/2/16	82/2/16	0.80
Ambulance driver	80/3/17	84/3/13	0.45
I was afraid of the reaction of the patient's relative			
Emergency physician	13/83/4	12/82/6	0.51
Nurse	14/78/8	17/76/7	0.60
Ambulance driver	14/74/12	10/80/10	0.27

* Scores on the visual-analogue scale (VAS) of stress (range, 0 [no stress] to 100 [maximum stress]) for health care professionals when family members were present or absent were compared with the use of the Wilcoxon rank-sum test. Responses to the questionnaire were compared with the use of either the chi-square test or Fisher's exact test.

our results were adjusted for the relative's relationship to the patient. Finally, our trial took place in patients' homes and did not evaluate in-hospital cardiac arrests. Trials in the hospital setting, such as the emergency department or intensive care unit, are needed to confirm our results, although some studies of pediatric trauma resuscitation show that family presence is not associated with negative outcomes.[22,28]

Despite these limitations, sensitivity analyses confirmed the robustness of our principal results. Hence, the findings of this randomized clinical trial bolster the current international recommendations regarding family presence during CPR.

In conclusion, our results show that the presence of a family member during CPR of an adult patient, performed in the home, was associated with positive results on psychological evaluations and did not interfere with medical efforts, increase stress in the health care team, or result in medicolegal conflicts.

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