The Psychological Effects on Family Members Who Witness CPR

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Abstract

Background:

Recent research has suggested that family presence during cardiopulmonary resuscitation (CPR) performed on a loved one may have beneficial psychological effects, such as lower incidences of post-traumatic stress disorder (PTSD), depression, or anxiety symptoms. This topic has been discussed since the 1980s, however the vast majority of the available information is of opinion or anecdotal form. The purpose of this systematic review of literature is to gather and interpret the data derived from formal research studies in attempt to better understand if families who witness CPR experience fewer incidences of PTDS, depression, or anxiety symptoms after the incident.

Methods:

An exhaustive search of available medical literature was performed using the databases MEDLINE-Ovid, CINAHL, Web of Science, PsychINFO, and Google Scholar. The keywords used for searching included family, cardiopulmonary resuscitation, psychological, and mental health. Also, the references of relevant articles were scanned for potential articles matching inclusion criteria.

Results:

Fifty-four articles were reviewed for relevancy. Three formal studies were found to meet inclusion criteria, including two RCTs and one observational study. One of the RCTs found significantly lower rates of PTSD and anxiety symptoms among family members who witnessed the resuscitation. (OR=1.7 95% CI 1.2-2.5, P=0.004; P=

Conclusion:

The presence of psychological benefits such as reduction in rates of PTSD, depression and anxiety symptoms are not yet certain. The evidence available to date is inconclusive. However, the evidence does strongly support a lack of harm to the family members who are present, as well as less than anticipated stress on the staff and absence of medicolegal grievances. Perhaps giving family members a choice to be present does help with bereavement time, coping, and acceptance. However, even though further research is needed, this review along with numerous other informal and formal studies collectively reinforce the conclusion that family witnessed resuscitation likely can be beneficial, and almost certainly, isn't harmful, indicating that it may be time to reconsider policy regarding family member presence during resuscitation.

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Biography

[Redacted for privacy]
Abstract

Background:
Recent research has suggested that family presence during cardiopulmonary resuscitation (CPR) performed on a loved one may have beneficial psychological effects, such as lower incidences of post-traumatic stress disorder (PTSD), depression, or anxiety symptoms. This topic has been discussed since the 1980s, however the vast majority of the available information is of opinion or anecdotal form. The purpose of this systematic review of literature is to gather and interpret the data derived from formal research studies in attempt to better understand if families who witness CPR experience fewer incidences of PTSD, depression, or anxiety symptoms after the incident.

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An exhaustive search of available medical literature was performed using the databases MEDLINE-Ovid, CINAHL, Web of Science, PsychINFO, and Google Scholar. The keywords used for searching included family, cardiopulmonary resuscitation, psychological, and mental health. Also, the references of relevant articles were scanned for potential articles matching inclusion criteria.

Results:
Fifty-four articles were reviewed for relevancy. Three formal studies were found to meet inclusion criteria, including two RCTs and one observational study. One of the RCTs found significantly lower rates of PTSD and anxiety symptoms among family members who witnessed the resuscitation. (OR=1.7 95% CI 1.2-2.5, P=0.004; P=<0.001 respectively), a significantly larger number of persons unable to complete the follow-up due to emotional distress (P=0.007), and found a significantly higher number of new psychotropic prescriptions written for family members in the control group (P=<0.001). The observational study found a significant decrease in depression symptoms for the witnessed group from 30 to 60 days (P=0.013). The last trial, a RCT, found no significant difference between witnessing and not witnessing resuscitation. The overall quality of evidence derived from the studies range from moderate to very low, one with a very strong study design and the others having small sample sizes and poor study designs.

Conclusion:
The presence of psychological benefits such as reduction in rates of PTSD, depression and anxiety symptoms are not yet certain. The evidence available to date is inconclusive. However, the evidence does strongly support a lack of harm to the family members who are present, as well as less than anticipated stress on the staff and absence of medicolegal grievances. Perhaps giving family members a choice to be present does help with bereavement time, coping, and acceptance. However, even though further research is needed, this review along with numerous other informal and formal studies collectively reinforce the conclusion that family witnessed resuscitation likely can be beneficial, and almost certainly, isn’t harmful, indicating that it may be time to reconsider policy regarding family member presence during resuscitation.

Keywords:
Family, cardiopulmonary resuscitation, psychological, and mental health.
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To the Pacific Faculty: Thank you for your profound efforts and infinite support. It is because of you all that we are able to complete this daunting, yet rewarding, task.

To my family: Thank you for being my support, my stability, and my strength.
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Table I: Characteristics of Reviewed Studies

List of Abbreviations

CES-D .................................................Center for Epidemiological Studies-Depression
CPR..........................................................Cardiopulmonary resuscitation
FWR..................................................................Family witnessed resuscitation
GRADE......Grading of Recommendations, Assessment, Development, and Evaluations
HADS..........................................................Hospital Anxiety and Depression Scale
IES..........................................................Impact Event Scale
PTSD..........................................................Post traumatic stress disorder
PSS-SR.........................................................PTSD Symptom Scale-Self Report
RTC..........................................................Randomized control trial
The Psychological Effects on Family Members Who Witness CPR

BACKGROUND

It has long been common practice in medicine to restrict family members from being present during cardiopulmonary resuscitation efforts. Occasionally, however, family members will demand to be present, resulting in the need for department or hospital protocol evaluation. Cardiopulmonary resuscitation can be a chaotic, rapid-paced, and traumatic scene for individuals to witness, thereby making their presence a point of concern for many healthcare providers. The topic has been in debate since the 1980s, though very few formally conducted studies have been produced, with most publications appearing as opinion or anecdotal articles. These publications, however, consistently reiterate that the families feel it is their right to be present and that they would recommend it for other families. These opinions warrant a valid assessment of the effects and safety of this potential practice.

The first qualitative study to be done regarding family-witnessed resuscitation (FWR) was by Hanson and Strawser in 1982 at Foote Hospital Emergency Department over the course of nine years. They found that the majority of family members felt their witnessing of the resuscitation allowed for better acceptance of the loss or decreased bereavement time. They also found that most family members who were not allowed to be present wished they had been extended the opportunity.

In 2006, Holzhauser et al conducted a randomized control trial (RCT) assessing family members feelings about their presence compared to those not allowed to witness. They found that all family members who were present were happy that they had been there and 96% felt it helped them deal with the loss.
Bereavement has the potential to cause clinically significant morbidity in loved ones who have suffered a loss. This is particularly true in cases where the loss was sudden or unexpected. These potential issues include, among many others, anxiety, depression, and post-traumatic stress disorder (PTSD). It may be possible that by implementing protocol such as allowing family to be present during resuscitation efforts, that these issues could be decreased, if not prevented in some circumstances.

The purpose of this literature review is to gather and interpret the data derived from formal research trials focused specifically on PTSD, depression, or anxiety symptoms of family members after they witness a loved ones’ resuscitation, in attempt to better understand the psychological effects. This information could prove valuable when departments or facilities are creating protocol regarding this subject and could help to open up this opportunity in more locations for family members who wish to be present at such a critical time. Beyond coping however, this review aims to shed light on a possible opportunity for disease prevention, in that the development of clinically relevant mental health pathology in family members following an incident such as this might be prevented if being present is indeed psychologically beneficial.

METHODS

A comprehensive and exhaustive search of the accessible medical literature was performed using the databases MEDLINE-Ovid, CINAHL, Web of Science, PsychINFO, and Google Scholar. The keywords used for searching included family, cardiopulmonary resuscitation, psychological, and mental health. Also, the references of relevant articles were scanned for potential studies matching inclusion criteria.

Inclusion criteria included formal studies, written in English, and addressing any or all of the topics of post-bereavement PTSD, depression, or anxiety symptoms. Exclusion criteria
included studies that relied solely on qualitative findings or non-legitimized psychological surveys, including invasive procedures as well as CPR as part of the study design, and studies focused on pediatric populations only. The three remaining studies were critically appraised and evaluated using the Grading of Recommendations, Assessment, Development, and Evaluations (GRADE).17

RESULTS

Fifty-four articles were reviewed for relevancy. Three formal studies were found to meet inclusion criteria, including two RCTs18, 19 and one observational study,20 as seen in Table I.

Jabre et al

This randomized control trial18 primarily assessed adults for PTSD-related symptoms and secondarily for depression and anxiety at 30 and 90 days post event using the Impact Event Scale (IES) and the Hospital Anxiety and Depression Scale (HADS). An IES score greater than 30 and an HADS score greater than 10 indicate clinically relevant symptoms. The study was conducted at 15 prehospital settings in France over a period of 24 months. Despite this being a prehospital study, the locations were required to have mobile intensive care units, and employ a full time ambulance driver, nurse, and physician.18

The randomization was assigned to the facility rather than the patients, though the method of randomization wasn’t explained beyond a “simple randomization process...” The results were calculated using an intention-to-treat analysis as well as witnessed versus non-witnessed group analysis. The sample size included 570 family members, with 266 in the witnessed group and 304 in the control group. In the witnessed group, 211 of the 266 (76%) actually witnessed the resuscitation event. In the control group, 173 of 304 (57%) did not witness the resuscitation. It was not made clear why or how members of the control group (43%) were
able to witness the resuscitation. At conclusion, 33 (6%) from the treatment group and 62 (11%) from the control group were lost to follow-up, leaving 475 total cases analyzed. Follow-up interviews were conducted at 30 and 60 days post event by a blinded clinical psychologist. Using the intent-to-treat analysis, the control group showed significantly higher rates of PTSD symptoms than the witnessed group (OR=1.7 95% CI 1.2-2.5, P=0.004) as well as a significantly larger number of persons unable to complete the follow-up due to emotional distress (P=0.007). The control group also showed a significantly higher presence of anxiety symptoms (P=<0.001).

When analyzed by witnessed versus non-witnessed instead of the intent-to-treat analysis, PTSD symptoms were also significantly higher in the control group (OR=1.6 95% CI 1.1-2.5, P=0.02). Regarding anxiety and depression symptoms, both showed a significant elevation for participants who did not observe the resuscitation (P=<0.001 and P=0.009 respectively). Lastly, when again analyzed by witnessed versus non-witnessed, they found a significantly higher number of new psychotropic prescriptions written for family members in the control group (P=<0.001).

The authors discussed several limitations of the study including it taking place in France where the medical system may differ from other countries. They also noted that not all patients died, though when analysis was run to exclude the 20 patients that survived, the results did not change. The researchers cited their range of close family members as a weakness, though it included only spouse, child, parent or sibling. Lastly, the study took place as a prehospital setting rather than hospital setting, which would make it more broadly applicable. They suggest the study should be repeated in a hospital setting to confirm their results.

Robinson et al
This study\textsuperscript{19} was the first randomized control trial conducted that addressed PTSD, anxiety, and depression symptoms, done in 1995 through 1997. The study assessed these symptoms at 3 and 9 months post event using the Impact Event Scale (IES), the Hospital Anxiety and Depression Scale (HADS), the Beck Depression Scale (BDI), Beck Anxiety Scale (BAI), and the Texas Inventory of Greif (TRIG). The study was conducted at the Accident and Emergency Department of Addenbrook’s Hospital, Cambridge, UK over a period of 16 months. The trial was stopped early due to concern for breach of randomization protocol by the staff, with staff believing the witnessing was beneficial and subsequently offering the opportunity to all families.\textsuperscript{19}

The randomization was assigned to the patient rather than the family members and done using sealed envelopes opened by the charge nurse upon arrival to the department. The results were calculated using an intention-to-treat analysis. The sample size included 25 patients undergoing resuscitation, with 13 in the witnessed group and 12 in the control group. At conclusion, 8 of the 13 from the witnessed group and 10 of 12 from the control group were retained for follow-up, leaving 18 total cases analyzed. The characteristics of the study population were not balanced amongst groups, with the witnessed group consisting mostly of persons who were not the closest relative being the most likely difference to introduce bias into the results. Follow-up interviews were conducted at 1 and 6 months post event in person, however blinding precautions were not mentioned.\textsuperscript{19}

This study showed no significant difference between the witnessed and control group in any of the psychological questionnaires. There was a consistent trend, (in five of the eight scales) for the witnessed group to have lower scores, though none of them were statistically significant. The only conclusion they could robustly draw from their data was that the family presence did
not appear to be psychologically harmful to the family members and that they should not be excluded from the resuscitation unless a compelling reason exists. The authors did not discuss limitations of the study but did mention that the results can only be applied to the emergency department and that other departments within the hospital may see differing results.¹⁹

Compton et al

This prospective observational trial²⁰ primarily assessed adults for PTSD symptoms and depression at 30 and 60 days post event using the PTSD Symptom Scale-Self Report (PSS-SR) and the Center for Epidemiological Studies-Depression (CES-D). Both of these have been established as valid tools among African Americans, which is pertinent to this study because this was the ethnicity for the majority of the population. The study was conducted at two urban hospitals in Detroit Michigan over a period of 24 months.²⁰

The witnessed group participants were selected if they were English-speaking, present while the resuscitation was occurring, and then suffered the loss of the loved one. The control participants were selected after a failed resuscitation attempt. The results were calculated using independent t tests. The sample size included 65 family members, with 24 in the witnessed group and 41 in the control group. At conclusion, only one family member was lost to follow-up, yet they were from the treatment group and the researchers decided to still include their data by assigning them as having all possible PTSD and depression symptoms. Follow-up interviews were conducted at 30 and 60 days post event, however blinding was not mentioned and likely not present.²⁰

This study showed no difference between the witnessed and control groups in either of the psychological questionnaires scores at either 30 or 60 days post event. They observed, however, a significant decrease in CES-D scores for the witnessed group (P=0.013) from 30 to
60 days. They also found a slight upward trend in scores for the subcategory, increased arousal, from the PSS-SR scale between 30 to 60 days, thought it was not statistically significant. When statistically correcting for gender, social support status and need for assistance in daily activities, there was again, no significant difference. Overall, they concluded that the family presence did not appear to be psychologically harmful.20

The authors discussed several limitations including the fact that almost 45% of all participants witnessed CPR prior to arriving at the hospital, a potentially serious confounder. They mention that the amount of time spent witnessing and the intensity of the resuscitation varies greatly from case to case and could alter the psychological response in family members. They cite the non-randomized study design as the reason for the drastic difference in characteristics between the witnessed and control groups and concede that it likely had a large impact on the results. However, the researchers justified the differences, stating that the selection bias likely displayed the most natural representation of situations that actually occur, this being that family either arrives with the patient or in time to be present or the patient arrives alone and remains alone. Lastly, researchers state that they stand by the study design chosen and its inherent limitations, but would like further research in more locations and larger sample sizes.20

DISCUSSION

This systematic review has demonstrated that this topic of family witnessed resuscitation is both difficult to tackle and its psychological effects on the family members who participate are not yet clear. This practice, however, could offer an opportunity to prevent passing along disease from one circumstance to another. Allowing family members an opportunity for greater acceptance and the piece of mind that everything that could be done for their loved one was indeed done could severe as a powerful tool to aid in bereavement. If grieving family members
can be afforded the opportunity to not suffer from an illness themselves due the loss of a loved one, then the issue should be explored more thoroughly.

The study by Jabre et al.,\textsuperscript{18} the most recent of the three studies,\textsuperscript{18-20} found significantly lower rates of PTSD and anxiety symptoms among family members who witnessed the resuscitation. This study\textsuperscript{18} in particular is potentially important, in that it was unprecedentedly large in sample size, and this may be why they found difference of statistical significance in their data. It is likely that the psychological effects of interest here are not overtly extreme and therefore requires large numbers in order to detect statistical differences. This is also supported by the fact that the other studies\textsuperscript{19,20} detected similar trends in data but not quite reaching statistical significance. The only exception being the Compton et al\textsuperscript{20} findings of a significant drop in CES-D scores in the treatment group between 30 and 60 days. There are numerous other informal and formal studies,\textsuperscript{3-12,21} including the ones mentioned previously by Hanson et al\textsuperscript{13} and Holzhauser et al\textsuperscript{14} that add relevant support to allowing family members to witness CPR on their loved ones. Collectively, they\textsuperscript{3-12,21} reinforce the conclusion that FWR likely can be beneficial, and almost certainly, isn’t harmful.

The overall quality of evidence derived from the studies range from moderate to very low, with Jabre et al\textsuperscript{18} having a large sample size and fairly strong study design and the others\textsuperscript{19,20} suffering from small sample sizes and poor study designs. Weaknesses of the Jabre et al\textsuperscript{18} study include that it has a cluster-randomization design which could introduce locational bias, that the most significant results were found by analyzing participants in groups they were not originally assigned to. Weaknesses of Robinson et al\textsuperscript{19} study include that the family member groups vary greatly from each other in ways that most likely would affect the results, and that the trial was stopped early due to concerns regarding compromise of the randomizations process.
This last issue could potentially delegitimize the entire study if the researchers were not aware of the issue soon enough. Weaknesses of the Compton et al\textsuperscript{20} study include that it has an observational study design instead of the more robust RCT, that the witnessed group disproportionality consisted of women who were both with the patient at the time of arrest, and also observed CPR prior to the hospital. This difference indicates that the treatment group may have had a greater number of closest family members, i.e. wives, versus the control group. Also, the precision seems to be lacking in this study due to large confidence intervals.

The most confining limitation in all of these studies\textsuperscript{18-20} is the issue of blinding. Because the family members participating in FWR cannot be blinded, future studies will continue to lack validity using a RCT study design. It should be noted, though, that Jabre et al,\textsuperscript{18} mentioned the blinding of the interviewer whereas the other two studies\textsuperscript{19,20} did not. This is a simple effort that was not taken by the other two studies\textsuperscript{19,20} and lead to a drop in their quality of evidence ratings (GRADE).\textsuperscript{17} It may be that a large prospective observational study would be the best approach for future studies pertaining to this question.

The most useful information garnered from this literature review is that the evidence unanimously agrees, the practice is not psychologically harmful and that the routine exclusion that is engrained in our medical protocol is likely not warranted. This exclusion, however, does not exist solely because of worry for the family members. There are several other facets including the potential stress placed on the providers by having the audience, the potential for the family members to interfere with the proper treatment of the patient, and the fear of legal repercussions. These issues, though not addressed here, are important factors in implementing such protocol. It should be noted, however, that all studies reviewed for background research for this literature review did not provide any evidence that these concerns are legitimate.
CONCLUSION

Psychological benefits such as reduction in rates PTSD, depression and anxiety symptoms are not yet certain. The evidence available to date is inconclusive. However, the evidence does strongly support a lack of harm to the family members who are present, as well as less than anticipated stress on the staff and absence of medicolegal grievances. Perhaps giving family members a choice to be present can help with bereavement time, coping, and acceptance.³ To more accurately assess its effects on family member psychological outcomes, further research is needed. However, because it will be difficult to double blind a study, a prospective observational study may be a better approach. Lastly, even though further research is needed, this review does indicate that it may be time to reconsider policy regarding family member presence during resuscitation.
**References**


10. Petterson M. Family presence protocol can be a powerful healing force. *Crit Care Nurse*. 


### Table I. Characteristics of Reviewed Studies

<table>
<thead>
<tr>
<th>Study</th>
<th>Design</th>
<th>Limitations</th>
<th>Inconsistency</th>
<th>Indirectness</th>
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<td>Psychological Effects of Family Witnessed Resuscitation</td>
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<tr>
<td>Jabre et al(^a)</td>
<td>RCT</td>
<td>Serious(^a)</td>
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<td>Not serious</td>
<td>Not serious</td>
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<td>Moderate</td>
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<tr>
<td>Robinson et al(^b)</td>
<td>RCT</td>
<td>Serious(^b)</td>
<td>Serious(^c)</td>
<td>Not serious</td>
<td>Serious(^d)</td>
<td>No</td>
<td>Very Low</td>
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<tr>
<td>Compton et al(^e)</td>
<td>Observational</td>
<td>Not serious</td>
<td>Serious(^f)</td>
<td>Not serious</td>
<td>Serious(^f)</td>
<td>No</td>
<td>Very low</td>
</tr>
</tbody>
</table>

\(^a\) Study used cluster randomization. A large number of controls witnessed CPR.
\(^b\) Study stopped early due to randomization compromise. Blinding was not present.
\(^c\) Study groups vary drastically.
\(^d\) Very small sample size.
\(^e\) Study groups vary drastically.
\(^f\) Confidence intervals very large.