Effects of Family-Witnessed Resuscitation After Trauma Prior to Hospitalization

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ABSTRACT
The purpose of this study was to examine the effects of family-witnessed resuscitation (FWR) in patients experiencing trauma from motor vehicle crashes and gunshot wounds prior to hospitalization. Family members of 33 patients (motor vehicle crashes: n = 19, 57%; gunshot wounds: n = 14, 43%) participated in this study. Within 1 to 2 days after admission to critical care, families who witnessed resuscitation and those who did not witness resuscitation were asked to participate. Reliable and valid measures for family resources, coping, problem-solving communication, and well-being were used. Results indicated that scores for family resources, coping, problem-solving communication, and well-being were no different in families who witnessed resuscitation compared with those who did not witness resuscitation prior to hospitalization in this study. The effects of FWR during the prehospital time period are not detrimental to family members. Further research needs to be conducted to examine the effects of FWR.

KEY WORDS
Critical care, Family, Resuscitation, Trauma

Unanticipated traumatic injury, subsequent resuscitation, and admission to critical care of a family member may be a cataclysmic event, the effects of which reverberate throughout the family unit. Annually, more than 1 million Americans undergo resuscitation and survive traumatic injuries only to produce major life changes for families. Several studies have been conducted that examined the effects of witnessed resuscitation on family members after hospitalization. However, none of these studies have included family members of trauma patients or determined the effect of witnessed resuscitation on families prior to hospitalization. The purpose of this study was to examine the effects of family-witnessed resuscitation (FWR) on patients experiencing trauma from motor vehicle crashes (MVC) and gunshot wounds (GSW). The primary aim was to compare the effects of FWR on family strengths (resources, coping, and problem-solving communication) with outcomes (well-being) and compare those strengths and outcomes in families who witness resuscitation with those who do not witness resuscitation prior to hospitalization. The proposed study has the potential to bring understanding to an often-neglected and vulnerable population who witnesses resuscitation by describing whether the experience fosters any initial positive or detrimental family outcomes.

BACKGROUND LITERATURE
The following review focuses on the prior research regarding FWR, conceptual framework, traumatic injury, and family strengths and outcomes to critical injury.

Family-Witnessed Resuscitation
Family-witnessed resuscitation means that the family observes the patient during resuscitation procedures. Resuscitation is a sequence of events initiated to sustain life or prevent further deterioration of the patient’s condition in an acute health episode. The following studies have been conducted on the effects of witnessed resuscitation on family members after hospitalization.

Family Benefits
Research exists that suggests that there are some benefits for families who witness the resuscitation of a family member. These benefits include knowing that everything possible was being done for the patient, feeling of being supportive and helpful to the patient and staff, sharing critical information about the patient’s condition,
maintaining family-patient relationships, closure on a life shared together, and fostering grieving. Most of the quantitative research in the adult setting has been descriptive designs, convenience samples with retrospective survey methods. Reliability and validity of the survey instruments also are not reported. Only 2 studies compared those family members who witnessed resuscitation with those who did not witness resuscitation but these studies were not conducted in the United States.

Healthcare Staff Concerns
There are also a variety of anecdotal reasons from healthcare professionals about not sanctioning FWR. These include concern that the event may be too traumatic for the family, clinical care might be impeded, family members may become too emotional or out of control, staff may experience increased stress, staff are focused on the patient and may not be available to assist the family, and the risk of malpractice suits. Reliability and validity of the instruments are not reported. These anecdotal reasons are based on personal opinion that contributes to the apprehension and controversy among healthcare professionals about supporting witnessed resuscitation for families.

Family Expectations
Despite the concerns of healthcare providers, families report that they want to be present. Family members not only emphatically assert the right to be present but state that FWR was important and helpful to them. Prior research results also indicate that there have been no adverse psychological effects on family members and the operations of the critical care providers were not disrupted. However, in these quantitative descriptive projects, researchers have enrolled small number of subjects and reliability and validity of the survey instruments are not reported.

Summary of FWR
Overall, lack of theoretical guidance, descriptive designs, and survey methods were used in prior studies. Limited comparative data are available to support the sanction of FWR. In addition, none of these studies have included family members of trauma patients. Whether FWR influences any outcomes of patients’ families requires further scientific investigation. It is currently unclear how and to what degree family strengths are related to family outcomes after trauma from MVC and GSW. Family-witnessed resuscitation research needs to progress from the descriptive level to the comparative level and include diverse family members. Furthermore, no study has been conducted to determine the effect of witnessed resuscitation on families prior to hospitalization.

Conceptual Framework
The Resiliency Model of Family Stress, Adjustment, and Adaptation guided the design and selection of variables for this study. The Resiliency Model depicts a set of relationships among family strengths and outcomes.

Family strengths include resources, coping, and problem-solving communication. Resources of individual family members, family unit, and community can already exist or be developed and utilized for management of specific trauma injury. Personal resources of family members include factors such as age, education, and prior experience with critical care. Family resources include flexibility and clear family rules. Community resources are those persons, groups, and institutions outside the family that can called upon to manage the stressor of patient injury.

Coping refers to specific cognitive and behavioral efforts used by the family to reduce or manage the stressors placed on the family and bring resources to manage the situation. Coping strategies can be grouped into patterns designed to maintain or strengthen the organization and relationships of the family unit, maintain emotional stability of family members, and manage a specific situation.

Patterns of problem-solving communication, that is, the communication that can either escalate conflict or be more supportive, also are part of the family’s responses to stressors. Coping and problem-solving communication are directed at reducing or eliminating the stressor, acquiring additional resources, and shaping appraisal.

Family adaptation is the outcome of family efforts to achieve a balance between the stress of critical injury and strengths to manage the crisis of critical injury. The demands of the stress may exceed the strengths of the family to manage the traumatic injury event. Inadequate family adaptation may be the result of family members’ low sense of family well-being.

Traumatic Injury
Traumatic injury is one of the most important threats to public health and safety in the United States. More than 3.5 million people are injured annually from MVC. These injuries constitute the leading cause of death in America for people of all ages. Gunshot wounds are the next leading cause of critical-injury deaths. It is estimated that critical injury from MVC and GSW costs the nation $574 billion, with $300 billion in wage and productivity losses and $98 billion in medical expenses in a single year. Traumatic injury is also a potential crisis situation for family members. Critical injury interferes with family structure and functions, and challenges the family’s established patterns of behavior. If the traumatic event is not handled optimally, the result may be prolonged physiologic...
and psychological instability of family members. At the
time of the highest level of stress, which is the initial phase
of critical injury, the least amount of attention may be
given to the family. Whether FWR fosters family
strengths and outcomes after trauma from MVC and
GSW remains to be determined.

**Family Strengths**

**Resources**

One strength used to manage a stressor event by prevent-
ing a crisis is described as family resources. Resources are
an essential factor in determining family adaptation. Families
possessing a large repertoire of resources more effectively
manage and adapt better to stressful situations such as critical injury. Personal, social, and economic family resources appear to mediate the relationship between stressful events and family outcomes. These family resources are especially needed in the early stages of patient injury and are found to reduce the postcrisis stress of families. The importance of accurate understanding of family resources is necessary for appropriate intervention and discharge planning. In addition, adequate resources may be key ingredients for positive family outcomes.

**Coping**

Family coping refers to strategies, patterns, and behaviors
designed to (a) maintain and/or strengthen the family, (b)
maintain the emotional stability of family members, (c) obtain and/or utilize resources to manage the situation, and (d) initiate efforts to resolve the family pressures created by the stressor. How families cope with stressors can adversely affect their health and well-being. Emotional reactions of family members during hospitalization are found to directly influence patient-coping responses. Much of the variance in family coping seems attributable to the crisis event more than individual differences in coping styles, but clearly an individual/event interaction exists. However, prior research findings with trauma patients were defined in this study as individuals, 18 years and psychological instability of family members. At the
time of the highest level of stress, which is the initial phase
of critical injury, the least amount of attention may be
given to the family. Whether FWR fosters family
strengths and outcomes after trauma from MVC and
GSW remains to be determined.

**Family Outcomes**

There is growing evidence that the stressor of traumatic
damage exerts a powerful influence on family outcomes. An imbalance among family strengths for meeting stressors is considered inadequate adaptation and can be manifested in deterioration of family members’ sense of well-being. Prior research indicates that family members of patients with trauma from MVC and GSW report no difference in family outcomes of well-being within 2 days of admission to surgical intensive care unit (SICU). Therefore, family members after trauma are more alike than different in their responses to well-being. Others suggest that families use their strengths to maintain their overall well-being. Further research is needed to determine the influence of family strengths on well-being after trauma.

**Summary**

The review of prior research not only confirms increased risk for difficult family adaptation after trauma from MVC and GSW but also indicates that this outcome is not inevitable. Previous studies are largely without theoretical guidance, rely on measures using only the spouse’s perspective of the family, use descriptive or survey designs, include few diverse families, and primarily focus on outcomes related to patient or spouse’s psychosocial functioning as an influence on the recovery process. Resources, coping, and problem-solving communication expand to meet the critical injury event or the family is unable to manage the event. The proposed study addresses several of these issues including using (a) theoretical guidance, (b) a comparative design, (c) responses from varied familial relationships to the patient (not only the spouse), and (d) culturally diverse groups of families.

**RESEARCH DESIGN AND METHODS**

**Design**

Data were used from a multivariate, prior comparison study to answer the research questions in this study.

**Setting**

Family members were recruited from a major level 1 trauma center in the Midwest. The critically ill trauma patients were admitted to a 21-bed SICU. Trauma patients were defined in this study as individuals, 18 years
of age and older, admitted to SICU, and requiring resuscitation prior to hospitalization.

**Subjects**
A convenience sample of family members of critically ill patients with trauma from MVC and GSW who were resuscitated prior to hospitalization was asked to participate in this study. Families were defined as a *group of individuals* bonded by biological, legal, or social relationships. Both genders and all minorities and nonminorities were eligible to participate in this study.

Participants in this study were 1 family member per patient who were 18 years or older, visited the patient in the SICU, spoke and understood English, and had only 1 critically injured patient in the family. Excluded from the study were families of trauma patients younger than 18 years and those patients with cardiac, burns, suicidal, and brain injuries because they were admitted to other units or specialized facilities.

**Procedure**
Within 1 to 2 days after admission to SICU, families who witnessed resuscitation and those who did not witness resuscitation were asked to participate in this study. This time period was selected because of uncertain patient outcome. Family members who witnessed resuscitation were matched to the group who did not witness resuscitation based on decade of patient age, gender, and admitting diagnosis. The research subjects review board of the setting approved the study. Informed consent was obtained from all family participants. Data from family members were collected in the privacy of the SICU conference room. It took about 20 to 30 minutes for participants to complete all self-report instruments.

**Instruments**
All instruments were chosen for theoretical congruence, ease of administration, sound psychometric properties, reading level below eighth grade, and suitability for diverse family constellations with varied social characteristics (see Table 1 for list of concepts, variables, measurers, minutes to complete, and internal consistency reliability). Total scores for all instruments were used in this study. The ordering of the instruments was varied to decrease the likelihood of consistency artifact that may occur in self-reports.41

**Demographic Information**
Family demographics (such as age, gender, ethnicity, relationship to patient, education, and previous critical care experience) were obtained from each participant. Patient’s age, ethnicity, and gender were obtained from the hospital record.

**TABLE 1**

<table>
<thead>
<tr>
<th>Construct</th>
<th>Variable</th>
<th>Measure</th>
<th>Number of Items/Minutes to Complete</th>
<th>Total α in This Study</th>
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<td>Family strengths</td>
<td>Resources</td>
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<td></td>
<td>Coping</td>
<td>Family Crisis-Oriented Personal Evaluation Scale</td>
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<td>.82</td>
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<tr>
<td></td>
<td>Communication</td>
<td>Family Problem-Solving Communication Index</td>
<td>10/3</td>
<td>.82</td>
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<tr>
<td>Family Outcomes</td>
<td>Well-Being</td>
<td>Family Member Well-Being Index</td>
<td>8/2</td>
<td>.72</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total Number of Items and Approximate Time for Completion of Questionnaires</td>
<td>68/20</td>
<td></td>
</tr>
</tbody>
</table>
FAMILY STRENGTHS

Resources

Family resources were measured by subscale 2 of the Family Inventory of Resources for Management. This family subscale includes 20 items that reflect resources along 3 dimensions: personal, family system, and health (physical and emotional). Personal resources refer to qualities of individuals that are used to help each other. Family-system resources include the ability to identify and use resources. Physical and emotional health is considered a necessary resource to meet the challenges of the critical injury. Subjects indicated on a 4-point scale from 0 (not at all) to 3 (very much so) what resources they believe they have available to them in the management of family life. Scores range from 0 to 60. Higher scores indicate more resources. Reliability and validity are well described. 30, 36, 42, 44

Coping

The Family Crisis-Oriented Personal Evaluation Scale measured coping. The scale measures coping strategies used by families in difficult or problematic situations. This 30-item tool requires family members to indicate the extent of agreement or disagreement on a 5-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Scores range from 30 to 150. Higher scores represent an increase in the number of coping strategies used, leading to more successful adaptation. Reliability and validity are well established. 30, 36, 42, 45

Communication

The Family Problem-Solving Communication Index was developed specifically for family stress research and the Resiliency Model measured communication. The 10-item measure is designed to assess the specific communication style that families use to manage and solve problems and conflicts in various types of stressful situations. The index is a self-report tool scored on a scale ranging from 0 (false) to 3 (true). Scores range from 0 to 30. Higher scores indicate a more supportive communication style with a calming influence in stressful situations. Reliability and validity are well established. 30, 46

FAMILY OUTCOMES

Well-being

Family well-being was measured by the Family Member Well-being Index. This 8-item inventory measures the degree to which a family member is adapted in terms of concerns about health, tension, energy, fear, anger, and general needs. The responses to each statement are scored on a Likert-type scale ranging from 1 (not concerned at all) to 10 (very concerned). Scores range from 8 to 80. Lower scores indicate the positive outcome of family efforts to achieve balance after a crisis. Reliability and validity are well documented. 30, 36, 42, 47

Data Analysis

Descriptive statistics were computed for all variables to ensure data quality. No missing data were used. Any demographic differences between groups were controlled for in subsequent data analysis with analysis of covariance.

RESULTS

Family members of 33 patients (MVC: n = 19, 57%; GSW: n = 14, 43%) participated in this study. Patients were 19 to 66 years old (M = 32.33; SD = 14.53). The majority was male (n = 23; 70%). Patient race was African American (n = 15; 46%), white (n = 14; 42%), and Hispanic (n = 4; 12%). Family members ranged in age from 18 to 61 years (M = 35.44; SD = 11.79). Most were female (n = 24; 73%). They described their relationship to the injured patients as sibling (n = 9; 27%), parent (n = 8; 24%), child (n = 5; 15%), spouse (n = 4; 12%), and other (n = 7; 21%). Family member race was reported as African American (n = 19; 58%) and white (n = 14; 42%). Education was 1 to 16 years (M = 12.30; SD = 2.64). The majority of family members had previous critical care experience (n = 26; 79%).

The FWR group (n = 16; 49%) was compared with those who did not witness resuscitation (n = 17; 51%). There were no differences among demographic variables between groups except family member age. The FWR group was younger (t = -2.57; P = .01). Therefore, family member age was used as a covariate in subsequent data analysis. The research question was: what are the effects of FWR on family strengths and outcomes in families who witness resuscitation compared with those who do not witness resuscitation prior to hospitalization? The results are displayed on Table 2. Scores for family resources, coping, problem-solving communication, and well-being were no different in families who witness resuscitation compared with those who did not witness resuscitation prior to hospitalization.

Limitations

Self-report measures have inherent limitations including distortion in recall of family information and lack of objectivity in perceptions that guide recording of responses. The time of collecting measures in this study may have underestimated the resources, coping, problem-solving communication, and well-being of family members after trauma from MVC and GSW. The data were cross-sectional so the impact of the FWR on family strengths and outcomes over time remains to be examined in further research. In addition, the sample size was small and data were collected in 1 setting. In addition, it is not known what invasive or cardiopulmonary resuscitation procedures were performed prior to hospitalization. With
only 1 family member per patient participating in this study, the determination of a family-level variable is not available. Those family members who witness resuscitation compared with those who do not witness resuscitation remain to be determined in future work that may enroll all available family members.

**DISCUSSION**

It is well known that critical injury has a significant impact on family members. The purpose of this study was to examine the effects of FWR on family strengths and outcomes in families who witness resuscitation compared with those who do not witness resuscitation prior to hospitalization. The results of this study indicate that the effects of FWR during this time period are not detrimental to family members. At least, the scores on family strengths and outcomes are more similar than different between the 2 groups.

The average scores of family resources and well-being in both groups are lower than those of other populations. Families with limited resources may have difficulty in managing the situation when a family member is critically injured and can manifest in the deterioration of family well-being. The family members of critically ill trauma patients who had MVC or GSW in this study seem to be facing the critical-care experience with decreased resources and well-being. This situation places them in a vulnerable situation without adequate resources to meet the critical-care situation.

Coping scores reported by family members after trauma are similar to the national norms. Families who have appropriate coping with the critical situation have better psychological outcomes than families with inadequate coping. Families operating with more coping behaviors also adapt to stressful situations more successfully. Families in this study seem to be facing the critical-care experience with adequate coping abilities.

Problem-solving communication appears to be important for families after life catastrophes. Better patient outcomes are reported in families with more communication. The problem-solving communication scores are similar to the national norms. These results suggest that family members of trauma patients initially are able to handle the stress of sudden injury.

This is the first study to examine FWR prior to hospitalization. In addition, only 1 other study has identified effects of FWR on adult patients who survived. It is important for trauma nurses to assess whether family members have witnessed resuscitation prior to hospitalization so appropriate intervention can be initiated.

**IMPLICATIONS**

Organizational support for FWR includes the American Association of Critical-Care Nurses, American Heart Association, Emergency Nurses Association, and Society of Critical Care Medicine. However, support is not universal. Most organizational support for FWR is based on a formal policy and procedure to guide the intervention. This study occurred prior to hospitalization so family members who witnessed resuscitation did not have the benefit of a formal procedure. Other authors have suggested that FWR was not appropriate for the trauma population. The results of this study contribute to the growing body of literature that FWR does not negatively affect family members. It appears that family members of trauma from MVC and GSW can participate in an FWR option. However, the long-term effects of FWR are still unknown.

Although there is mounting evidence on the benefits of FWR, many issues remain to be investigated. Future study is needed on the long-term effect on families who

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Witness (n = 16), Mean (SD)</th>
<th>Not Witness (n = 17), Mean (SD)</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Family Inventory of Resources for Management subscale</td>
<td>32.62 (10.20)</td>
<td>35.86 (12.71)</td>
<td>0.04</td>
<td>.84</td>
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<td>Family Crisis-Oriented Personal Evaluation Scale</td>
<td>115.49 (12.18)</td>
<td>116.98 (16.88)</td>
<td>0.01</td>
<td>.89</td>
</tr>
<tr>
<td>Family Problem-Solving Communication Index</td>
<td>22.44 (4.15)</td>
<td>23.94 (4.09)</td>
<td>0.74</td>
<td>.30</td>
</tr>
<tr>
<td>Family Member Well-being Index</td>
<td>33.43 (9.52)</td>
<td>34.64 (11.48)</td>
<td>0.13</td>
<td>.71</td>
</tr>
</tbody>
</table>
have witnessed resuscitations. Family members in this study completed the instruments very early after the traumatic injury. The psychological effects of FWR may not be apparent until weeks and months (even years) following the traumatic event. Additional studies with larger sample sizes and in various populations, as well as experimental studies with more longitudinal follow-up, are necessary to clearly discern the psychological effect of FWR on patients’ family members.

Witnessing a subsequent death after resuscitation prior to hospitalization also needs to be studied. These families usually do not have support services available to them. Whether the images of a resuscitation and subsequent death produce a lasting negative impression remains to be determined. The short- and long-term effects of this experience are also unknown.

The issue of FWR is a source of continued controversy in trauma settings. Further research with FWR after trauma needs to be conducted. Trauma nurses play a key role in advocating for patients and family members. These nurses will ultimately play a crucial role as FWR evolves into a better-defined practice.

REFERENCES