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Family Presence during Resuscitation after Trauma

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Abstract

Purpose—The primary aim was to examine the effects of family presence during resuscitation (FPDR) in patients who survived trauma from motor vehicle crashes (MVC) and gunshot wounds (GSW) in the emergency department.

Background—The ongoing controversy of FPDR, dearth of comparative designs, small sample sizes, and survey methods makes it difficult to come to a definitive conclusion about any benefits of FPDR.

Methods—The Resiliency Model guided the selection of variables. A multivariate, comparison, prospective design was used. A convenience sample of family members participated within three days of admission to critical care. Family strengths were measured by the Family Crisis Oriented Personal Scale, Family Inventory of Resources for Management, and Family Problem Solving Communication Index. Family outcomes were measured by the State anxiety portion of the State Trait Anxiety Inventory, Acute Stress Disorder Scale, Family Member Well-being Index, and Family Satisfaction in the Intensive Care Unit Scale.

Results—Family members of 140 trauma patients (MVC $n=110$; 79%; GSW $n=30$, 21%) participated. Family members ranged in age from 20–84 years ($M=46$, $SD=15$, $Mdn=47$). The majority were female ($n=112$, 80%) and related to the patient as spouse ($n=46$, 33%). Participating

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Dr. Leske was the Principal Investigator who conceived and designed the project.

Dr. Brasel was the Co-Investigator who participated in designing the project and implementing the study.

Dr. Feetham was the Consultant who participated in designing the work and interpreting the results.

Ms. McAndrew was the Research Assistant who participated in collecting the data.

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in the FPDR option reduced anxiety ($t = -2.43, p = .04$), reduced stress ($t = -2.86, p = .005$), and fostered well-being ($t = 3.46, p = .001$) but was not significant for satisfaction with critical care ($t = -.28, p = .78$).

Discussion—Results demonstrate the positive initial effects of FPDR on family members of patients surviving trauma injury. Long term effects of FPDR remain unknown.

Keywords

family presence; resuscitation; trauma; critical care

Unexpected traumatic injury, subsequent resuscitation, and admission to critical care of a family member can be a cataclysmic event: the effects of which reverberate throughout the family unit. Annually, there are over 41 million visits to the emergency department (ED), 2.5 million hospital admissions, and millions undergo resuscitation and survive traumatic injuries, producing major life-changes for families (Centers for Disease Control and Prevention, 2016; National Trauma Institute, 2014). Trauma is a significant public health problem and most patients survive (Egol, Tolisano, Spratt, & Koval, 2011). Family presence during resuscitation (FPDR) is an innovative, multidisciplinary option that is intended to provide family-centered care early in the critical care experience, but the effects of FPDR on families of those critically injured from trauma have not been well studied.

The overall purpose of this multivariate, prospective, and comparative study was to examine the effects of the FPDR option on family outcomes in patients surviving critical injury after motor vehicle crashes (MVC) and gunshot wounds (GSW). The primary aim was to examine the effects of the FPDR option on family outcomes (anxiety, stress, well-being, and satisfaction) up to 72 hours post trauma; and compare those outcomes in families who participated in FPDR to those families who did not participate. A secondary aim was to examine any moderating effects of family strengths (coping, resources, and communication) on family outcomes.

Background Literature

The following review focuses on the conceptual framework; traumatic injury; prior research on FPDR; and family strengths and outcomes to critical injury.

Conceptual Framework

A conceptual model of family adaptation in response to a stress event guided the selection of variables and measures used in this study (McCubbin, Thompson, & McCubbin, 1996). This model depicts the influence of family strengths on family outcomes. In this study, family strengths included coping, resources and communication. Family outcomes consisted of state anxiety, state stress, well-being, and satisfaction (See Figure 1).

Traumatic Injury—Traumatic injury is one of the most important threats to public health and safety in the U.S. with an economic burden of \$671 billion a year, including both health care costs and lost productivity (National Trauma Institute, 2014). Trauma knows no bounds of age, gender, race, or socioeconomic status and can happen to anyone at any time.

In 2014, the number of people injured in MVCs increased from 2.31 to 2.34 million, and 32,675 Americans were killed (U.S. Department of Transportation, 2016). Gunshot Wounds (GSW) are the next leading cause of critical injury deaths following MVCs (NCHS, 2016). Traumatic injuries constitute the third leading cause of death for people of all ages, and the number one cause of death for those less than 46 years of age (National Trauma Institute, 2014).

Traumatic injury is a potential crisis situation for family members when the patient is admitted into critical care (Agård & Harder, 2007; Auerbach et al., 2005; Azoulay et al., 2005; Jones et al., 2004; Soderstrom, Saveman, Hagberg, & Benzein, 2009; Winston, Baxt, Kassam-Adams, Elliott, & Kallan, 2005). During the critical care period, families must deal with many stressors including: role changes, financial concerns, uncertain prognosis, isolation from other family members, dramatic disruptions in daily routines, making decisions, and unfamiliar critical care environments (Baumhover & May, 2013; Davidson, 2009; Davidson et al., 2007; Figley & Barnes, 2005; Leske, 2000). Health care professionals (HCP) expect families to absorb highly technical and potentially devastating information while making rapid decisions when they face the critical injury of a family member (Blom, Gustavsson, & Sundler, 2013; Eggenberger & Nelms, 2007; Leske, 2000). Challenges in forming and maintaining relationships with other family members and HCP are the most frequently cited family stressors (Azoulay et al., 2001; Rodriguez, 2005; Wong, Liamputtong, Koch, & Rawson, 2015).

Prior Research about FPDR—Use of FPDR in the clinical arena has been debated in the literature around the world for the last 20 years; predominately discussion has been around family benefits, concerns of HCP, and family expectations (Porter, Cooper, & Sellick, 2013; Porter, Cooper, & Sellick, 2014).

Family Benefits: Researchers report there are some benefits for families who are present during the resuscitation of a family member (Egging et al., 2011; Holzhauser, Finucane, & DeVries., 2006; Macy et al., 2006; Morse & Pooler, 2002; Terzi & Aggelidou, 2008; Weslien, Nilstun, Lundqvist, & Fridlund, 2006). 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 (Terzi & Aggelidou, 2008; Weslien et al., 2006).

Concerns of HCP: There also are a variety of reasons from HCP for not providing the FPDR option which include: (a) concern that the event may be too traumatic for the family; (b) clinical care might be impeded; (c) family members may become too emotional or out of control; (d) staff may experience increased stress; (e) staff are focused on the patient and may not be available to assist the family; (f) nursing shortages; and (g) the risk of malpractice suits (Basol, Ohman, Simones, & Skillings, 2009; Compton et al., 2006; Demir, 2008; Fisher et al., 2008; Ganz & Yoffe, 2012; Itzhaki, Bar-Tal, & Barnoy, 2011; Kirchhoff et al., 2007; Madden & Condon, 2007; Mortelmans, Cas, Van Hellemond, & De Cauwer, 2009; Twibell et al., 2008; Walker, 2008). A recent systematic review of the attitudes of HCP regarding FPDR indicated a between and within disciplines difference in attitudes exist;

specifically perceived burden on staff, perceived effects on family, and lack of hospital policy influenced attitudes towards FPDR (Howlett, Alexander, & Tsuchiya, 2010). Lack of empirical support for FPDR contributes to the controversy among HCP for offering the option (Oman & Duran, 2010). Effects of FPDR on families of patients who *survive* have not been well studied.

Family Expectations: Despite the concerns of HCP, families report that they want to be present again if a similar event occurred (Duran et al., 2007; McMahon-Parkes, Moule, Bengier, & Albarran, 2009; Mortelmans, et al., 2009). Family members not only emphatically reported the right to be present, but stated that FPDR was important and helpful to them (Davidson et al., 2007; Leske, McAndrew, & Brasel, 2013). Prior research results indicate that when the option of FPDR was provided there were no adverse psychological effects for family members and the operations of the HCP were not disrupted (Compton et al., 2006; Oman & Duran, 2010; Oczkowski, Mazzetti, Cupido, & Fox-Robichaud, 2015; Pasquale, Pasquale, Bage, Eid, & Leske, 2010). Although participating in the FPDR option may not be appropriate for every family, most believe they have the right to be present (Albarran, Moule, Bengier, MaMahon-Parkes, & Lockyer, 2009; Boucher, 2010; Mortelmans, et al., 2010).

Family Strengths

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 family stress (McCubbin & Thompson, & McCubbin, 1996). How families cope with a stress event can adversely affect their health (Littleton et al., 2007; Rodriguez, 2005). Emotional reactions of family members during hospitalization also are found to directly influence patient coping responses (Agaibi & Wilson, 2005; Davidson et al., 2007). However, prior research findings with trauma patient's family members indicate that they are able to initially cope with the critical injury (Leske, 2000, 2003). Therefore, coping strategies may serve as a guide for further understanding the effect of FPDR on family outcomes after trauma.

Resources—Resources are an essential factor in determining family adaptation (Agaibi & Wilson, 2005; Littleton, Horsley, John, & Nelson, 2007). Personal, family system, and social support resources have particular relevance for family health (McCubbin, Thompson, & McCubbin, 1996). Families possessing a large repertoire of resources more effectively manage a stress event than those families with few resources (Leske, 2000, 2003; McCubbin, Thompson, & McCubbin, 1996). Family resources are especially needed in the early stages of patient injury and are found to reduce the post-crisis stress of families (Agaibi & Wilson, 2005; Patterson, 2002). The importance of accurate understanding of family resources is necessary for appropriate patient/family assessment, intervention, and discharge planning. In addition, adequate resources may be the key ingredient for positive family outcomes (Lefebvre & Levert, 2012).

Communication—The family's ability to organize a stressor into manageable components, identify alternative courses of action, and cultivate patterns of communication needed to gain control over the situation refers to problem-solving communication and is strongly related to positive family outcomes (McCubbin, Thompson, & McCubbin, 1996).

Understanding the medical condition and having information about the patient's progress are necessary for appropriate family problem solving to occur (McCubbin, Thompson, McCubbin, 1996; Verhaege et al, 2007).

Family Outcomes

The stress event of traumatic injury exerts a powerful influence on family outcomes (Figely & Barnes, 2005). Physical and emotional health of family members suffers during patient hospitalization (Auerbach et al., 2005; McAdam & Puntillo, 2009; Rodriguez, 2005).

State Anxiety—Prior research indicates that anxiety is common among family members during the critical care experience (Azoulay et al., 2005; McAdam, Fontaine, White, Dracup, & Puntillo, 2012; Norup, Siert, & Mortensen, 2010; Paparrigopoulos et al., 2006; Pochard et al., 2005; Rodriguez, 2005). At least one-third of family members of critical care patients suffer from symptoms of anxiety (Fumis, Martins, & Schettino, 2012; McAdam et al, 2012). The family's anxiety focuses largely on concerns for the patient's survival, and is often exacerbated by physical separation from the family member who is in critical care (Leske, 2000). Some families report more anxiety than patients (Paparrigopoulos et al., 2006; Pochard et al., 2005). When families face this level of anxiety, they may be unable to support the patient or make decisions, and they may transfer their anxiety to the patient (Anderson et al., 2009; Holden, Harrison, & Johnson, 2002). In addition, high family anxiety may lead to prolonged patient recovery (Lefebvre & Levert, 2012; Paparrigopoulos et al., 2006; Pochard et al., 2005; Young et al., 2005). However, state anxiety appears to decline when information is provided to family members during the critical care period (Chien, Chiu, Lam, & Ip, 2006; Friedemann-Sanchez et al., 2008).

State Stress—Any clinical course that runs counter to the family's expectations for a positive patient outcome is an important contributor to critical care-related stress (Auerbach et al., 2005; Azoulay et al., 2005; Norup, Siert, & Mortensen, 2010). These researchers suggest that about three-fourths of family members are at major risk for stress-related symptoms. Higher rates of stress have been reported among family members who felt information received in critical care was incomplete or dissatisfactory, and/or of patients with higher severity of injury (Auerbach et al., 2005; Azoulay et al., 2005; Fox-Wasylyshyn, El-Masri, & Williamson, 2005; Friedemann-Sanchez et al., 2008; Verhaeghe, Defloor, & Grypdonck, 2005). Stress levels of the family tend to rise when their needs are not met (Davidson et al., 2007; Fox-Wasylyshyn et al., 2005). However, little is known about the stress of family members of trauma patients.

Well-being—An imbalance among family strengths can be manifested in deterioration of family members' sense of well-being (McCubbin, Thompson, & McCubbin, 1996). Theory suggests that families use their strengths to maintain their overall well-being (McCubbin.

Thompson, & McCubbin, 1996). However, the influence of family strengths on family well-being after trauma is not well known.

Satisfaction—The Patient Protection and Affordable Care Act mandates the use of measures to assess patient satisfaction. In critical care, patient satisfaction data may be difficult to obtain; family satisfaction often is a substitute (Roberti & Fitzpatrick, 2010). Therefore, family satisfaction is an important outcome measure in critical care (Azoulay, et al 2001; Paul & Rattray, 2008; Roberti & Fitzpatrick, 2010; Wall, Engelberg, Downer, Heyland, & Curtis, 2007). Dissatisfied families are less able to provide positive support to the patient, less likely to trust HCP, and less ready to contribute if important decisions need to be made (Auerbach et al., 2005; Paul & Rattray, 2008). The most prominent source of dissatisfaction for families is the lack of information about the patient in critical care (Auerbach et al., 2005; Fox-Wasylyshyn et al., 2005; Hunziker et al., 2012). Providing interventions to promote family satisfaction may be important to improve patient care outcomes (Agaibi & Wilson, 2005; Auerbach et al., 2005).

Summary—The review of prior research confirms increased risk for difficult family adaptation after trauma but also indicates that this outcome is not inevitable. Minimal research has been reported that contributes to understanding family outcomes after trauma. Previous studies (a) are largely without theoretical guidance; (b) rely on measures using only the spouse's perspective; (c) use descriptive or survey designs; (d) have small sample sizes in one setting, (e) include few diverse families; (f) do not use family measures; (g) include few family members of trauma patients, (h) reliability and validity of the survey instruments are not reported, and (i) primarily focus on outcomes related to patient or spouse's psychosocial functioning as an influence on the recovery process. According to the model used in this study, positive family outcomes involve a process of adaptation (McCubbin, Thompson, & McCubbin, 1996). Family strengths either expand to meet the needs posed by trauma injury or the family is unable to manage the event (McCubbin, Thompson, & McCubbin, 1996; Soderstrom, Saveman, Hagberg, & Benzein, 2009).

Methods

Design

A multivariate, prospective, and comparison design was used in this study. A strength of this study design was that it did not depend on family self-selection for the FPDR option, rather, it was the consensus of the trauma team and availability of family members in the ED at the time of the resuscitation that determined whether FPDR occurred. Due to the nonrandomized design, careful attention was paid to fidelity of the FPDR option and statistical covariate analysis.

Setting

Subjects were recruited from southeastern Wisconsin's only adult Level 1 trauma center; part of a 516-bed Magnet™ designated tertiary care hospital that generally serves a suburban catchment area of approximately 3 million people. The FPDR option had been standard practice for over five years at the study site.

Subjects

Trauma patients were defined as individuals, 18 years of age and older, who *survived* resuscitation by the trauma team and were admitted from the ED to the 21-bed Surgical Intensive Care Unit (SICU).

Family was defined as a group of individuals bonded by biological, legal, social, or emotional relationships (Basol, Ohman, Simones, & Skillings, 2009; Davidson et al, 2007; Leske, 2003). Participants in this study were adult family members of critically injured trauma patients; spoke and understood English; and had no more than one critically injured patient in the family. They were eligible to participate in this study up to 72 hours after admission to SICU. Only one family member per trauma patient was enrolled.

Excluded from the study were family members of trauma patients: less than 18 years old, because they were unlikely to be present in the adult SICU; with cardiac, burns, and suicidal injuries, because they were admitted to other specialized facilities; and those who expired at the scene. Also excluded were family members of patients considered for possible organ donation (end-of-life), prisoners (cannot have visitors), and victims of domestic violence (injured by another family member) (Leske, McAndrew, Evans, Garcia & Brasel, 2012). Family members who were excluded from the FPDR option per hospital policy because of combativeness, agitation, extreme emotional instability, altered mental status, or intoxication also were excluded. An ED log was kept to determine family availability (Leske et al, 2012).

Calculation of sample size was based on the pilot study of the effect of the FPDR option on family outcomes ($\eta^2=0.06$; $f=0.24$) (Leske & Brasel, 2010). Using this anticipated effect size, it was determined that a sample size of 70 per group (70 participating in FPDR and 70 not participating) was adequate to attain 0.80 power at the alpha 0.05 level.

Procedure

Patients met criteria for physiologic or anatomic activation of the trauma team with subsequent resuscitation in the ED. At the time of trauma resuscitation in the ED, the physician and team agreed to the FPDR option. Alert patients would verbally agree and a family facilitator (FF) offered the FPDR option to family members if they were present. A specially trained social worker prepared the family for FPDR and guided them through the process. In order to provide the FPDR option, special training and hospital policy were developed at the study site. The hospital policy and procedures for the FPDR option followed national clinical practice guidelines (AACN, 2016; ENA, 2012).

Within 72 hours after admission to SICU, trauma patients' families participating in the FPDR option were asked to participate. This time period was selected due to uncertain patient outcome and availability of family members (Leske et al, 2012). Family members who did not participate in the FPDR option already existed in clinical practice. This was due to not being present in the hospital at the time of the resuscitation. Within 72 hours after admission to SICU, trauma patients' families who did receive the FPDR option also were asked to participate. Ongoing monitoring of sample selection occurred to assure diversity of family member participation. Only members of the research team obtained study data (Leske et al, 2012). This study was approved by the hospital and medical school's Institutional

Review Board for the Protection of Human Subjects. Written, informed consent was obtained from all participants.

Actions were taken to maintain integrity of the study protocol, including structured training for the FF, monitoring of FPDR fidelity, standardized instrumentation, monthly team meetings, and training for data collectors. A member of the research team observed at random the FPDR to assure procedural fidelity and compliance with the hospital policy. In addition, the dose of the FPDR was recorded as to length of the resuscitation, length of time of family presence, and what procedures were done to the patient.

Data were collected in the privacy of a nearby SICU conference or private waiting room. It took about 25 minutes for participants to complete all self-report instruments. There was no difficulty in recruiting family members during this sensitive time frame and the majority of family members agreed to participate (Leske, 2000, 2003; Leske & Brasel, 2010; Leske et al, 2012; Pasquale et al, 2010).

Instruments

All instruments were chosen for theoretical congruence, ease of administration, sound psychometric properties, reading level below 8th grade, suitability for diverse family constellations with varied social characteristics, and minimal response burden. Total scores were used in this study.

Demographic Information—Family demographics (including age, gender, race/ethnicity, relationship to patient, education, occupation, employment status, income, prior ICU experience, and health conditions) were obtained from participants in both groups.

Patient demographics were collected from the hospital record and included age, gender, ethnicity, occupation, mechanism and type of injury, mode of transportation to hospital, Glasgow Coma Score (GCS) at admission, and Injury Severity Score (ISS).

Family Strengths

Resources—Family resources were measured by the family strengths subscale of the Family Inventory of Resources for Management (FIRM) (McCubbin, Comeau, & Harkins, 1996). This 20-item self-report subscale included items that reflected family resources. Subjects indicated on a four-point scale from 0 (not at all) to 3 (very much so) what family strength resources they believe they had available to them. Total FIRM scores range from 0–60 with higher scores indicating increased resources. Reliability and validity are well described (Leske, 2000, 2003; Leske & Brasel, 2010; Leske & Jiricka, 1998; McCubbin, McCubbin, & Thompson, 1996). Alpha reliability was .90 in this study.

Coping—Coping was measured by the Family Crisis-Oriented Personal Evaluation Scale (F-COPES) (McCubbin, Olson, & Larson, 1996). This 30-item self-report tool required family members to indicate the extent of agreement or disagreement on a five-point Likert scale from 1 (strongly disagree) to 5 (strongly agree). Total F-COPES scores range from 30–150 with higher scores representing an increase in coping strategies. Reliability and validity

are well established (Leske, 2000, 2003; Leske & Brasel, 2010; Leske & Jiricka, 1998; McCubbin, McCubbin, & Thompson, 1996). Alpha reliability was .82 in this study.

Communication—Communication was measured by the Family Problem-Solving Communication Index (FPSC) (McCubbin, McCubbin, & Thompson, 1988). The 10-item measure was designed to assess the specific communication style that families use to manage and solve problems. The index was a self-report tool scored on a 0 (false) to 3 (true) scale. Total scores range from 0–30 with higher scores indicating greater problem-solving communication. Reliability and validity are well established (McCubbin, Thompson, & McCubbin, 1996; McCubbin, McCubbin, & Thompson, 1988). Alpha reliability was .90 in this study.

Family Outcomes

State Anxiety—State anxiety was measured by the S-Anxiety portion of the State Trait Anxiety Inventory (STAI) Form Y (Spielberger, 1977). This 20-item self-report scale evaluated qualities such as current feelings of apprehension, tension, nervousness, and worry. The responses to each statement were scored on a Likert-type scale, ranging from 1 (not at all) to 4 (very much so). Total S-Anxiety scores range from 20–80 with higher scores represented an increase in anxiety. Reliability and validity are well documented (Moser, 2007; Pochard et al., 2005; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983; Young et al., 2005). Alpha reliability was .93 in this study.

State Stress—The Acute Stress Disorder (ASD) scale measured state stress (Bryant, Moulds, & Guthrie, 2000). The 19-item ASD scale measured distress that an individual family member could experience in the acute phase of a traumatic experience. The responses to each statement were scored on a Likert-type scale, ranging from 1 (not at all) to 5 (very much). Total ASD scores range from 19–95 with higher scores reflecting greater stress. Evidence for reliability and validity have been reported (Bryant, Moulds, & Guthrie, 2000; McAdam & Puntillo, 2009). Alpha reliability was .93 in this study.

Well-being—Family well-being was measured by the Family Member Well-being Index (FWBI) (McCubbin & Patterson, 1982). This inventory measured the degree to which a family member was adapted in terms of general concerns about health. The responses to each statement were scored on a Likert-type scale, ranging from 1 (not concerned at all) to 10 (very concerned). Total FWBI scores range from 8–80 with higher scores reflect increased adaptation. Reliability and validity are well documented. (Leske & Jiricka, 1998; Leske, 2003; McCubbin, Thompson, & McCubbin, 1996). Alpha reliability was .84 in this study

Satisfaction—Family satisfaction was measured by the Family Satisfaction in the Intensive Care Unit scale (FS-ICU) (Heyland & Tranmer, 2001). The responses to each statement were scored on a Likert-type scale, ranging from 1(not applicable) to 6 (excellent). Items were scored so higher values indicated higher satisfaction. Reliability and validity are documented (Heyland & Tranmer, 2001; Wall, Engelberg, Downer, Heyland & Curtis, 2007). Alpha reliability was .89 in this study.

Data Analysis

Quantitative data were analyzed with SPSS for windows software (Statistical Package for the Social Sciences version 22 (IBM, 2013)). Descriptive statistics were initially computed for all variables to ensure data quality. Any missing data at the item level was handled by multiple imputation methods. Family member and patient demographic characteristics were checked to identify any significant differences between families who participated in FPDR and those families who do not participate.

The primary aim was to examine the effects of the FPDR option on family outcomes of anxiety, stress, well-being, and satisfaction up to 72 hours post trauma; and compare those outcomes in families who participated in FPDR to those families who do not participate. Analysis of covariance (ANCOVA) was used with the measures of family strengths (coping, resources, and communication) serving as covariates. In addition, a single propensity score was created and used as another factor to account for any residual differences between the group of families who participated in FPDR and those families who do not participate. The propensity scores were divided into quintiles to produce a 2×5 factorial design. To test the main effects of FPDR on family outcomes, a 2-way ANCOVA was computed with FPDR as the first factor, the propensity score (divided into 5 levels) as the second factor, and the three family strength measures as explicit covariates.

The secondary aim was to examine any moderating effects of family strengths (coping, resources, and communication) on family outcomes of anxiety, stress, well-being, and satisfaction; and compare any moderating effects in families who participate in FPDR to those families who did not participate. The same propensity score was used for measures of family and patient demographics. Analysis of covariance (ANCOVA) was used with FPDR as the first factor and family strengths measures as covariates.

Results

No significant differences were found between groups on any demographic variables. See Figure 2 for a flow diagram of study participants. Family members ($n=140$) ranged in age from 20–84 years ($M=45.74$; $SD=15.03$. $Mdn=47$). The majority were female ($n=112$, 80%) and related to the patient as spouse ($n=46$, 33%). Family member education ranged from 8–20 years ($M=13.46$, $SD=2.20$, $Mdn=13$). The patient sample ranged in age from 18–93 years ($M=43.27$, $SD=20.82$, $Mdn=42$). The majority were male ($n=99$, 71%) and critically injured from MVC ($n=110$, 79%). A secondary diagnosis of traumatic brain injury was recorded in 37% of the patient sample ($n=52$). In addition, 31% ($n=44$) arrived to the hospital via Flight for Life air transport. (See Table 1)

Results of the primary aim indicated that participating in the FPDR option significantly reduced family reports of anxiety ($t=-2.43$, $p=.04$) and stress ($t=-2.86$, $p=.005$); and fostered family reports of well-being ($t=3.46$, $p=.001$). The effects of participating in the FPDR option was not significant for satisfaction with critical care ($t=-.28$, $p=.78$). The results of the secondary aim indicated that family resources moderated stress in the FPDR group ($t=2.59$, $p=.01$) (See Table 2).

Discussion

The FPDR option remains controversial and not the usual practice in most trauma centers. One of the reasons for the underutilization of FPDR has been the lack of sophisticated research on the effects of FPDR on family outcomes. This study addresses these concerns by using: (a) theoretical guidance, (b) comparative design with adequate sample size, and (c) responses from various and diverse family members after trauma injury. Results contribute to the growing body of research that FPDR has beneficial effects for family members, at least during the initial critical care experience.

Anxiety scores significantly were lower in the FPDR group. However, scores for both groups remain above the national norms (Spielberger et al, 1983). Family member high anxiety is consistently reported in other research. (Anderson et al., 2009; Bailey et al., 2010; Fumis et al., 2012; McAdam et al., 2012; Wolters et al., 2015). A recent systematic review reported that anxiety was better in family members who were offered FPDR (Oczkowski, Mazzetti, Cupido, & Fox-Robichaud, 2015). Symptoms of stress can be severe in family members of critical care patients (Anderson et al., 2009, Auerbach et al., 2005; McAdam & Puntillo, 2009). However, effects of participating in the FPDR option on reducing family stress depends on increased family resources during this time frame. Decreased family well-being has been reported by family members during critical care especially when they ignore their own health concerns (Johansson, Hildingh, Wenneberg, Fridlund, & Ahlström, 2006). In this study, family well-being scores significantly were higher in the FPDR group and above the national norms (McCubbin, Thompson, & McCubbin, 1996).

The use of a designated FF was important in this study. This procedure follows prior research that the FF is separate from the resuscitation team (Porter, Cooper, & Sellick, 2014; Sak-Dankosky, Andruszkiewicz, Sherwood, & Kvist, 2014; Terzi & Aggelidou, 2008). This may be difficult in some practice settings but is essential to assess family dynamics, level of distress, and level of understanding of the situation. Training and support for the FF are instrumental in the implementation of a FPDR protocol.

Limitations

The major limitation to this study was the inability to randomize the FPDR option. FPDR was offered only when the trauma team agreed and family were available. The data were cross sectional so the impact of the FPDR option on family outcomes over time remains to be examined in further research. In addition, self-report measures have inherent limitations. The timing of outcome measures collected within 72 hours of traumatic injury may underestimate the anxiety, stress, well-being, and satisfaction of family members. Recall bias may be of concern due to the stress of trauma. The data were collected in one site, thus, generalizability to other setting cannot be assumed.

Conclusion

The vital role of the family in the health and recovery of the critically injured patient is well recognized (Davidson et al., 2007; Leske, 2003; Leske & Brasel, 2010). Yet, during critical care, when family involvement is urgently needed, family members report that their helping

behaviors are negatively impeded by high anxiety and stress (Davidson et al., 2007; Duran et al., 2007; Holzhauser et al., 2006; Paparrigopoulos et al., 2006; Terzi & Aggelidou, 2008), leading to inadequate family participation in patient rehabilitation, prolonged patient recovery, and increased health care costs. The results of this study suggest that participating in the FPDR option may help the family be better equipped to help the patient during the initial critical care period.

Critical injury interferes with family structure and function, and challenges the family's established patterns of behavior (Auerbach et al., 2005; Pochard et al., 2005; Rodriguez, 2005). If the traumatic event is not handled optimally, the result may be prolonged physiologic and psychological instability of family members (Anderson, Arnold, Angus, & Bryce, 2009; Rodriguez, 2005). 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 (Azoulay et al., 2001).

FPDR remains consistent with the core principles of a partnership that recognizes the integral role of the family in the recovery of the patient. Recognizing the importance of the family on patient recovery after trauma, health care professionals (HCPs) in EDs ought to continue to offer the option of FPDR. Incorporating a family-centered approach such as FPDR in the delivery of critical care may promote more positive family outcomes (Oczkowski et al, 2015).

The study setting had a formal FPDR policy for several years. Policy development for FPDR does not seem to be universal but is important for patient/family-centered care progression. Patient/family-centered care may benefit from a formal policy in each institution to standardize FPDR practice. However, the phenomenon of FPDR may be too complex to capture fully its effects on families via statistical inquiry alone. Exploring the nature and meaning of FPDR and its aftermath from the perspective of families may provide formative information for the development and application of effective FPDR. In addition, a qualitative exploration of patients' appraisals of family involvement in their care following trauma may provide another vital viewpoint in comprehending the capacity and utility of FPDR.

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Key Points

Participation in FPDR has beneficial effects for family members of trauma patients.

Participation in FPDR reduces family anxiety and stress during the first 72 hours after trauma.

Participation in FPDR fosters family well-being during the first 72 hours after trauma.

Assessment of family resources is important for designing family interventions after trauma.

Long term effects of participation in FPDR remains to be determined for family members of trauma patients.

Figure 1.

Model to examine family presence during resuscitation after trauma.

Adapted from McCubbin, M.A. & McCubbin, H.I. (1996). Resiliency in families: A conceptual model of family adjustment and adaptation in response to stress and crises. In H.I. McCubbin, A.I. Thompson, & M.A. McCubbin (1996). *Family assessment: Resiliency, coping and adaptation-Inventories for research and practice* (pp. 1–64). Madison: University of Wisconsin System.

Figure 2.
Flow diagram of study participants

Table 1

Characteristics of Sample

Variable	Sample <i>n</i> =140
Family Member Gender	Female 112 (80%) Male 28 (20%)
Family Member Age	20–84 M=45.74 (SD=15.03) Median 47 years
Family Member Ethnicity	Non Hispanic 130 (93%) Hispanic 10 (7%)
Family Member Race	White 101 (72%) African American 25 (18%) Asian 3 (2%) American Indian 3 (2%) Other 8 (6%)
Family Member Relationship	Spouse 46 (33%) Parent 37 (26%) Child 26 (19%) Sibling 14 (10%) Other 17 (12%)
Family Member Education	8–20 M=13.46 (SD=2.20) Median 13 years
Patient Gender	Male 99 (71%) Female 41 (29%)
Patient Age	18–93 M=43.27 (SD=20.82) Median 42 years
Patient Marital Status	Married 59 (43%) Single 57 (42%) Divorced 14 (10%) Other 7 (5%)
Patient Injury	MVC 110 (79%) GSW 30 (21%)
Patient GCS	3–15 M=12.81 (SD=4.03) Median 15
Patient ISS	1–50 M=16.22 (SD=9.88) Median 14
Patient arrival	Ambulance 96 (69%) FFL 44 (31%)
TBI	Yes 52 (37%) No 88 (63%)

Note: MVC Motor Vehicle Crash; GSW Gunshot wound; GCS Glasgow Coma Scale; ISS Injury Severity Score; FFL Flight for Life; TBI Traumatic Brain Injury

Table 2

Comparison of Family Outcomes

Instrument	Not Present (n=70)			Present (n=70)			Statistic		p=
	Range	Mean (SD)	Median	Range	Mean (SD)	Median	t=		
S-STAI	23–80	48.1 (13.66)	46.00	25–69	43.53 (12.25)	41.50	–2.43		*p<.05 .043*
ASDS	19–82	44.10 (16.09)	40.00	19–85	36.27 (14.89)	30.50	–2.86		.005*
FWBI	0–74	43.87 (15.98)	45.00	17–73	53.30 (15.16)	57.00	3.46		.001*
FS-ICU	42–83	74.42 (9.06)	77.00	57–83	74.04 (6.87)	75.00	–0.28		.783

Note: State anxiety was measured by the S-Anxiety portion of the State Trait Anxiety Inventory (S-STAI), state stress was measured by The Acute Stress Disorder (ASD) scale, family well-being was measured by the Family Member Well-being Index (FWBI), and family satisfaction was measured by the Family Satisfaction in the Intensive Care Unit scale (FS-ICU).