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**THE ROLE OF RESILIENCE ON
SECOND-VICTIM OUTCOMES:
EXAMINING INDIVIDUAL AND EXTERNAL FACTORS
OF MEDICAL PROFESSIONALS**

by

CLAUDIA HERNANDEZ
B.S. University of Central Florida, 2016

A thesis submitted in partial fulfillment of the requirements
for the degree of Master of Science
in the Department of Industrial/Organizational Psychology
in the College of Sciences
at the University of Central Florida
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ABSTRACT

The present work is intended to bring awareness to medical professionals impacted by the occurrence of errors they have committed or witnessed (i.e., second-victims) and highlight the negative effects that may result from such errors. The purpose of this research is to test whether resilience and negative affect that is experienced after a medical error are related. Additionally, four variables are tested as moderators of this relationship, two of which are considered individual variables (i.e., self-efficacy and work meaningfulness), and two of which are characterized as external variables (i.e., co-worker support and organizational support). Twenty-two healthcare professionals from a hospital's Cardio-Vascular Intensive Care Unit participated in a short survey. Results showed a relationship exists between resilience and negative affect experienced by second victims, post-error. The limitations of the current work, practical implications, and ideas for future research will be expanded upon herein.

ACKOWLEDGEMENTS

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CHAPTER ONE: INTRODUCTION

The Institute of Medicine reported that medical error is the eighth leading cause of death in the United States, resulting in 100,000 deaths each year (IOM, 2000). When this statement is presented, most people will automatically think about the patients affected. Indeed, this is an imperative issue. However, most people likely will not think about the medical professional who committed or witnessed the error (i.e., the second victim). These errors are unintentional and although research has shown many of them are preventable, human error is inevitable. Anytime a human is involved, there will always be some potential for error to occur (Daniel & Makary, 2016).

The present work is not intended to shift attention away from patients, but rather to bring awareness to second victims and highlight the negative effects that may result from such error, given that research in this area is lacking. Beyond highlighting the importance of second victims, the purpose of the present research is to identify the relationship between second victims and resilience. More specifically, a set of individual and external factors hypothesized to be linked to resilience are examined. Additionally, the extent to which such factors influence the negative feeling and emotions experienced by second victims are examined. This research will be conducted by implementing a cross-sectional design, in which medical professionals will respond to a questionnaire assessing key factors, as noted above.

CHAPTER TWO: LITERATURE REVIEW

Second Victims

When referring to adverse medical events within healthcare, recent literature has touched on first, second, and third victims (Wu, 2000). A first victim is the patient (and the family of the patient) who has been affected by the event. The second is the clinician who committed the error, while the third refers to the organization itself. The investigation of first victims, patients and their families, has been researched extensively (Doveyet al., 2002; Forster, Murff, Peterson, Gandhi, & Bates, 2003; Thomas et al., 2000; Zhao & Olivera, 2006). Although it is imperative to continue such research, the second victims, medical professionals, must also be considered. By failing to focus on those who make the mistakes and how such events might affect them, a sustained impact on patient safety within the literature and more importantly, in practice, will not be obtained.

The term "second victim" is relatively recent as it was first introduced in 2000 by Wu. A recent systematic review conducted by Seys and colleagues (2013) analyzed 32 articles to identify the most all-encompassing definition of second victims. A second victim can be defined as the following (Scott et al., 2009):

> A health care provider involved in an unanticipated adverse patient event, medical error and/or a patient related–injury who become victimized in the sense that the provider is traumatized by the event. Frequently second victims feel personally responsible for the unexpected patient outcomes and feel as though they have failed their patient, second guessing their clinical skills and knowledge base (p. 326).

It is vital to highlight and explore second victims given that such experiences have been linked to a number of negative impacts on individuals. Research has revealed that almost half of health care providers could be considered second victims at least one time during their career (Edrees, Paine, Feroli, & Wu, 2011).

Seys and colleagues' (2013) systematic review on second victims revealed a prevalence of psychological, physical, behavioral, and cognitive symptoms resulting from medical errors. Furthermore, they identified long-term effects associated with second victims. More specifically, of 41 articles examined, nearly half ($n =19$) associated second victims with feelings of guilt. Anger, fear, and irritation were also psychological symptoms consistently seen. Symptoms that were still identified but occurred less frequently include the following: physical (i.e., fatigue and lack of sleep), behavioral (i.e., insomnia), and cognitive (i.e., trouble concentrating). Long-term effects identified were burnout, decreased life quality, PTSD and loss of memory.

Such negative effects can lead to impaired performance, and thereby create additional safety hazards (Seys et al., 2013). Some second victims expeience flashbacks and avoid situations that may remind them of the trauma (Scott et al., 2009). In extreme cases, healthcare professionals have left their jobs or have committed suicide after their experience (Lander et al., 2006). For those who are impacted severely and decide to stay at work, their feelings may carry over to how they perform in the future, perpetuating the possibility of another error, and resulting in a recurring cycle.

"Although patients are the first and obvious victims of medical mistakes, doctors are wounded by the same errors: they are the second victims"(Wu, 2000, p. 726). Wu also states that it's not only doctors that are susceptible to being second victims. Nurses, pharmacists, and other

members of the health care team are also vulnerable to being second victims. Due to the hierarchical nature of healthcare settings, medical professionals that are not physicians have less support to cope with their mistakes. Often times, they are witnesses to mistakes and feel conflicted regarding loyalties to the patient, institution, and team, causing them to be victims of the situation (Denham, 2007). Therefore, it is essential to identify the factors that facilitate medical professionals who are second victims to get through such experiences without being severely psychologically impacted.

<center>Resilience</center>

Though the literature on second victims has discussed the negative effects that can result from medical errors and proposed some coping methods (Edrees et al., 2011), the role that resilience occupies in second victims experiencing negative effects does not seem to be emphasized. In the late 70's and early 80's, investigators began exploring a number of individual difference variables, in search of explaining why some people easily fail under stress, while others appear to be more resilient (Johnson & Sarason, 1978; Lefcourt, Miller, Ware, & Sherk, 1981; Kobasa, 1982).

Resilience is defined as "the ability of an individual to respond to stress in a healthy, adaptive way such that personal goals are achieved at minimal psychological and physical cost; resilient individuals not only 'bounce back' rapidly after challenges but also grow stronger in the process" (Epstien & Krasner, 2013, p. 301). Simply stated, it usually refers to an individual's ability to recover after a setback (Fletcher and Sarkar, 2012). As a result of increased interest in resilience, researchers have put forth a number of different conceptualizations of the term. Past research has defined resilience as trait, process, and, at times, an outcome (Davydov et al., 2010).

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Resilience as a trait has been defined as "a [fixed] personality characteristic that moderates the negative effects of stress and promotes adaptation" (Wagnild & Young, 1993, p. 165). Researchers who have defined resilience as a process describe it as fluid and dynamic in nature, gradually developing over time and influencing outcomes (Egeland et al., 1993; Luthar, Cicchetti, & Becker, 2000). Those who define it as a process believe a complex interaction of multiple factors determine whether resilience is demonstrated. Conversely, those who conceptualize resilience as an outcome tend to see it as as a dichotomy (i.e., poor outcomes, positive outcomes); despite some arguing for outcomes being viewed on a continuum (Glantz & Sloboda, 1999). Despite conceptual differences, Fletcher and Sarkar (2013) highlight that, overall, resilience definitions are based on both adversity and positive adaptation.

For the purposes of the current effort, I conceptualize resilience as a process. Although I believe certain personality traits predispose individuals to be more or less resilience, my belief is consistent with the literature that states resilience can develop over time and is fluid in nature. Currently, there is work that examines factors related to resilience, but this is either not in the medical context (O'Leary, 1998; Ungar, 2013; Wildermuth & Pauken, 2008) nor in relation to second victims. While some work has examined resilience in similar domains (e.g., firefighters who also work in high-risk environments), that work tends to focus solely on individual factors related to resilience (Regehr, Hill, & Glancy, 2000). After conducting a literature search on resilience paired with terms such as "individual factors" and "external factors," 101 articles were identified. Although 50 articles were healthcare related, none of the articles mentioned second-victims.

The lack of research on resilience and other moderating variables within the context of second victims may be due to the fact that the topic of second victims is still in its infancy. However, scholars have posited that resilience may be an important factor in explaining why some individuals cope with traumatic events more successfully than others (White, Driver, & Warren, 2010). Therefore, based on the arguments presented above, the following is proposed:

Hypothesis 1: There will be a negative relationship between resilience and negative affect experienced by second victims.

A number of researchers have examined the relationship that different individual and external factors have on resilience. Though there are a number of factors that may impact resilience, the four proposed herein (i.e., meaningfulness of work, self-efficacy, organizational support, and co-worker support) are expected to play a significant role in the context of second victims given that the setting of the errors is in the workplace.

Individual Factors

Meaningfulness of Work

Past research has suggested that meaningfulness is a "major characteristic" of resilience (Taylor & Reyes, 2012; Wagnild, 2009). Specifically, some researchers have posited that life meaning is the most important characteristic of resilience as it provides the foundation for the perseverance, self-reliance, existential aloneness, and equanimity, which are considered the remaining four characteristics of resilience (Wagnild, 2009b). Taylor and Reyes have defined meaningfulness as "the realization that life has a purpose and the valuation of one's contributions" (p. 4).

Most work on meaningfulness and resilience has been conducted in the context of meaningfulness of life. Smith, Epstein, Ortiz, Christopher, and Tooley (2013) noted that the perception of a purposeful life results in greater resilience. The adjustment individuals make during a stressful or traumatic event can be due to meaning-making, which has been conceptualized as the restoration of meaning in high-stress scenarios (Park, 2010). Researchers have suggested that changing beliefs about an experience can lead to the alleviation of distress. This means that searching for meaning can help a victim adjust to trauma in the long-term. In a study that longitudinally examined Americans before and after the 9/11 attack in New York, researchers found that the more meaning people found as time passed after the attack, the fewer posttraumatic stress symptoms they exhibited over time (Updegraff, Silver, & Holman, 2008).

Perceived meaning has also been shown to predict positive psychological outcomes such as self-efficacy, psychological health, hope, life satisfaction, and happiness (Bronk, Hill, Lapsley, Talib, & Finch, 2009; Dogra, Basu, & Das, 2011; Drescher et al., 2012). Conversely,

the perception of a meaningful life is negatively correlated with use of alcohol, depression, psychological distress, and suicidal ideation (Dogra et al., 2011; Schnetzer, Schulenberg, & Buchanan, 2013; Schulenberg, Schnetzer, & Buchanan, 2011).

While little work has been done in this area and none has specifically examined the relationship between meaningfulness of work and resilience, in the context of second victims, the degree to which they perceive their work to have purpose should serve as a proximal buffer to the negative affect often associated with second victims. Similar to meaningfulness of life, a lack of meaningful work (i.e., meaningless work) has been shown to be linked to negative affect and outcomes (i.e., low self-esteem, poor performance – Sievers, 1984). Therefore, the argument above along with the general arguments about meaningfulness are leveraged to provide support for the next hypothesis:

Hypothesis 2: Meaningfulness of work will moderate the relationship between resilience and negative affect, such that higher levels of work meaningfulness result in a stronger negative relationship between resilience and negative affect.

<div align="center">Self-Efficacy</div>

Another individual characteristic to consider when referring to resilience is self-efficacy. Self-efficacy has been defined as "beliefs in one's capabilities to mobilize the motivation, cognitive resources, and courses of action needed to meet given situational demands" (Wood & Bandura, 1989, p. 408). Gillespie, Chaboyer, and Wallis (2007) categorize self-efficacy as a defining attribute of resilience. Given that self-efficacy refers to the belief in one's ability to successfully achieve a goal, it has been identified as a coping mechanism (Reivich & Shatte, 2002), which may facilitate resilience.

<div align="center">8</div>

Under the Social Cognitive Theory (SCT), self-efficacy refers to the perception about an individual's confidence in their ability to accomplish a task in reference to a specific context (Bandura, 1977). There are two important components of self-efficacy: 1) temporal and 2) context-based. Goddard, Hoy, Woolfolk, and Hoy (2004) state that perceptions of self-efficacy are appraisals about future actions, not appraisals of the actual outcome. Additionally, self-efficacy is domain-specific and can vary depending on the task. In other words, an individual may have a high level of self-efficacy when it comes to their day-to-day activities at work, but low self-efficacy when taking an exam for school. It is also possible for some individuals to have an overall sense of efficacy across different domains, while others have varying levels of self-efficacy depending on the tasks (Bandura, 1997).

Past work from Bandura (1997) has highlighted a direct link between resilience and self-efficacy, stating that higher levels of self-efficacy will result in persistence regardless of the obstacles and challenges that arise. Conversely, a low sense of efficacy tends to result in quitting when faced with challenges. While self-efficacy has been shown as an antecedent to resilience, the confidence evidenced by individuals with high self-efficacy can also serve to mitigate the relationship between resilience and the negative affect often experienced by second victims. As stated by Wu (2000), second victims often doubt their clinical skills and knowledge base after an error occurs (i.e., efficacy tends to decrease). Individuals who are able to maintain a sense of efficacy in the face of being a second victim are likely to experience less negative affect compared to those who cannot. This notion suggests that those with higher levels of self-efficacy are more likely to be resilient given that they believe in themselves and their ability to reach their desired outcomes. Therefore, Hypothesis 3 is as follows:

Hypothesis 3: Self-efficacy moderates the relationship between resilience and negative affect, such that higher levels of self-efficacy result in a stronger negative relationship between resilience and negative affect.

<u>External Factors</u>

Perceived Organizational Support

Looking beyond individual factors, there are also external factors that have an influence on the relationship between resilience and affective outcomes. The first external factor to consider is the support provided by an organization. Organizational support has been defined as "the extent to which employees perceive that their contributions are valued by their organization and that the firm cares about their well-being" (Eisenberger, Huntington, Hutchins, & Sowa, 1986, p. 501). Though past research has not addressed the role that organizational support plays in such a relationship, it is important to consider and explore. Research has shown that when an organization treats their employees well, employees tend to perform better and increase their affective commitment to the organization (Eisenberger, Cummings, Armeli, & Lynch, 1997).

This notion has been referred to as the norm of reciprocity, which states that employees respond positively to favorable treatment from an employer. Conversely, if an employee perceives a lack of organizational support, their organizational involvement and affective commitment tend to decrease, ultimately resulting in turnover (Eisenberger, 1997). Therefore, resilience and affect are likely to decrease if an employee perceives a lack of support from the organization. This is especially true in the context of second victims. Given that second victims often times feel personally responsible for adverse medical events and feel as if they have failed their patient (Scott et al., 2009), knowing that the organization cares and is forgiving about

mistakes will likely help mitigate some of the negative affective outcomes that would result from an error. For this reason, Hypothesis 4 is as follows:

Hypothesis 4: Organizational support will moderate the relationship between resilience and negative affect, such that higher levels of organizational support will result in a stronger negative relationship between resilience and negative affect.

Co-Worker Support

Similar to organizational support, support from co-workers also becomes integral for second victims. Interpersonal relationships play an important role in influencing how people think, feel, and behave. Research has shown that support from family, friends, community members, and neighbors (i.e., social support) is important for enhancing resilience (Ozbay, Johnson, Dimoulas, Morgan III, Charney, & Southwick, 2007). However, little research has been conducted on peers within the workplace (i.e., co-workers). In this context, it becomes extremely important to consider coworkers, rather than just relationships at home, given that second victims commit or witness errors while they are at their workplace. Therefore, work peers will be closest to them in proximity and their support will have a more immediate impact. Additionally, coworkers are more likely to relate and understand what a second victim may be going through, due to their familiarity with the job.

Social support has been identified as a buffering mechanism in stressful situations (Abramson, Seligman, & Teasdale, 1978), which suggests that the lack of support from co-workers is likely to result in increased negative affect when an error occurs. Additionally, lack of support may cause a person to feel like they need to hide their mistakes from peers so that no one knows who is to blame for the incident. Past research has shown that social support helps

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increase self-esteem and feelings of belonging, which would decrease negative moods in stress-inducing situations (Cohen & McKay, 1984). Additionally, some research has proposed that peer support helps facilitate resilience (Wilks and Spivey, 2010). Given that social support has been shown to decrease negative moods and impact resilience, but has not been studied in the context of work (i.e., coworkers) the fifth and final hypothesis is put forth:

Hypothesis 5: Co-worker support moderates the relationship between resilience and negative affect, such that more support from co-workers will result in a stronger negative relationship between resilience and negative affect.

Figure 1 is meant to represent a conceptual model to aid in the consolidation of the hypotheses posited above.
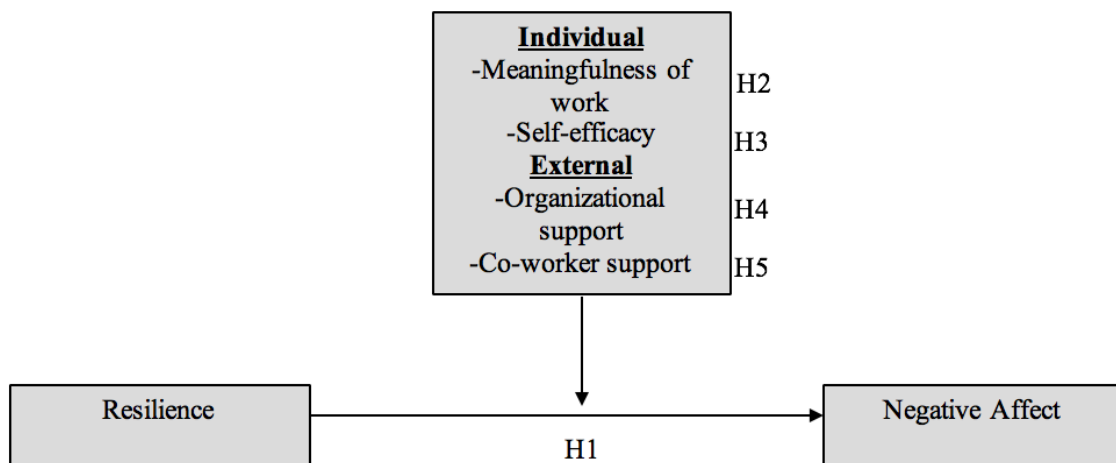

Figure 1: Conceptual Model of Proposed Hypotheses

CHAPTER THREE: METHODOLOGY

Participants

Participants ($N = 22$) were obtained from large southeastern hospital system in the United States, ranging from physicians, residents, and nurses. The majority of respondents reported working in their current department for under one year to three years (71.4%). A physician from the hospital's cardio-vascular ICU (CV-ICU) was the main point of contact and distributed the online survey. All responses were self-reported. The sample of interest was selected due to the likelihood of triggers and stressors within the CV-ICU environment. Due to the nature of the work, participants have the opportunity to make and witness errors to which they might be able to refer in their responses. The total number of survey responses received was 66, but the final sample was 22 due to either (1) incomplete surveys or (2) answering "no" to the first question, which asked if the participant had committed or witnessed an error in the within the past year. The surveys identified as incomplete only contained answers for the first few demographic questions and did not contain data for the main variables of interest. The majority of respondents excluded were due to the latter reason.

Design and Procedure

A fully cross-sectional design was be implemented. Resilience was the independent variable and negative affect was examined as a dependent variable. The following factors were examined as moderators of this relationship: meaningfulness of work, self-efficacy, organizational support, and co-worker support.

Hospital staff members were contacted through email in January of 2019 with a request from the main point of contact asking to participate in the online survey. Participants were provided with the hospital's recommended timeframe of approximately 2 weeks to complete the survey. Participation was encouraged, but completely voluntary. The survey was completed online, through a trusted third-party survey software called Qualtrics. All data collected within the timeframe when the survey was open was included in the present study.

As mentioned above, once a participant clicked on the survey link, the first question asked whether he/she had committed or witnessed a medical error. If the answer was no, a message was displayed which thanked the individual for his/her time and, at that point, they were dismissed. If participant answered "yes," he/she were prompted to the next section of the survey and were instructed to think about the medical error when answering the questions throughout the rest of the survey. At the end of the study, participants were provided with an opportunity to allow suggestions about ways in which hospitals can help support second victims, and finally, were thanked for their participation in the research.

Measures

Resilience

To measure resilience, the Connor-Davidson scale was used (Connor & Davidson, 2003). This scale has been used in the past to measure resilience as a process, which is consistent with the its conceptualization in the present work. The original 25-item scale was created by Connor and Davidson (2003), then Campbell-Sills and Stein (2007) later tested the psychometric properties of the scale, creating shortened version, which contains ten items. The shortened version of the measure was used in the present study and was found to have an acceptable

reliability score ($\alpha = .89$). Responses were self-reported using a 5-point Likert scale ranging from 'not true at all' to true nearly all the time.' One sample item is, "I can deal with whatever comes my way." In order to score this scale, each item was summed and the highest possible score, which would indicate the highest degree of resilience, was 50.

Meaningfulness of Work

Meaningfulness of work was measured using a 3-item scale ($\alpha = .96$) from Spreitzer (1995). One of the items within this scale reads: "The work I do is very important to me." Although the original author highlights that this was created as a 7-point scale, the anchors were not specified. Therefore, following the approach of more recent researchers (Callister, 2006; Harris, Kacmar, & Zivnuska, 2007), this self-report measure was implemented as a 5-point scale ranging from 'strongly disagree' to 'strongly agree.'

Self-Efficacy

In order to measure self-efficacy, Chen, Gully, and Eden's (2001) 8-item general self-efficacy scale was be used ($\alpha = .92$). Given that research has supported the notion that self-efficacy is context-specific (Bandura, 1977), participants were instructed to think about the items in this scale within the context of their work. This measure is also a 5-point Likert type scale with options from 'strongly disagree' to 'strongly agree.' One of the scale's items reads, "I am confident that I can perform effectively on many different tasks."

Perceived Organizational Support

In order to measure participants' perception of organizational support, a shortened version scale, which contains 8-items ($\alpha = .87$), was used (Eisenberger, Cummings, Armeli, & Lynch, 1997). Some sample items include "my organization really cares about my well-being"

and "my organization shows little concern for me." Any items that were negatively worded, such as the latter, were reverse coded prior to the calculation of a composite score. The scale was a self-reported, 5-point Likert type scale with options from 'strongly disagree' to 'strongly agree.'

Co-Worker Support

Co-worker support was measured with the use of a 6-item scale from Ray and Miller (1994). This 5-point Likert type scale ($\alpha = .90$) ranged from 'strongly disagree' to 'strongly agree.' One sample item reads, "my coworkers go out of their way to make my life easier."

Outcomes

To measure affect levels, the Positive Affect Negative Affect Scale (PANAS), developed by Waston, Clark, and Tellegen (1988), was used. The scale measures the extent to which participants are experiencing positive or negative feelings and emotions. This scale can be used to ask about current mood states or in the context of referring back to a specific situation, the latter of which was used for the current study. This 5-point Likert-type scale contained options ranging from 'very slightly or not at all' to 'extremely.' Participants were asked to think back to the time of the error and rate the extent to which they experienced 20 different emotions after they witnessed or committed an error. Some of these emotions are "guilty; nervous; scared; jittery." The measure contains positive and negative affect subscales. For the purposes of the present work, only the negative affect scale was analyzed ($\alpha = .85$). Higher scores on this scale indicate higher levels of negative affect.

CHAPTER FOUR: FINDINGS

Descriptive Statistics

All analyses were performed using Version 25 of SPSS, a statistical analysis program. Given that the topic of second victims is still new to the literature, some variables aside from those related to the hypotheses were analyzed to provide descriptive statistics that could inform future research on the topic. . In reporting on the category of error severity, the most frequently occurring were errors not having caused harm to the patient, those causing temporary harm, and those causing permanent harm, each being reported by 28.6% of participants. These were followed by 14.3% saying that the error resulted in patient death (see figure 2). Moreover, the majority of participants reported that those errors which occurred took place three to four months prior to taking the survey (see Figure 3). Additionally, of the 22 respondents, 31.8% reported personally having committed the error and 68.2% stated they witnessed someone else make the error.
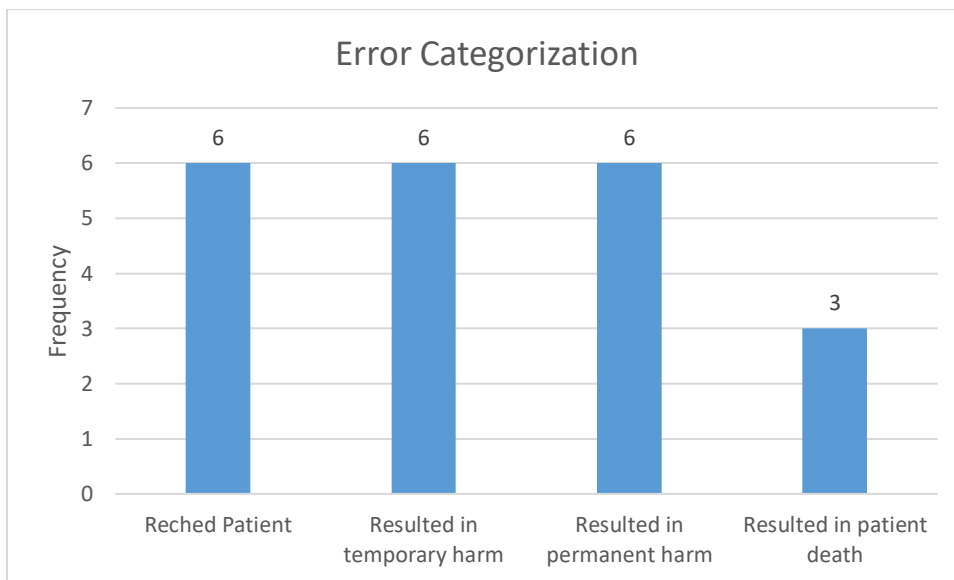
Figure 2: Error Severity Categorizations
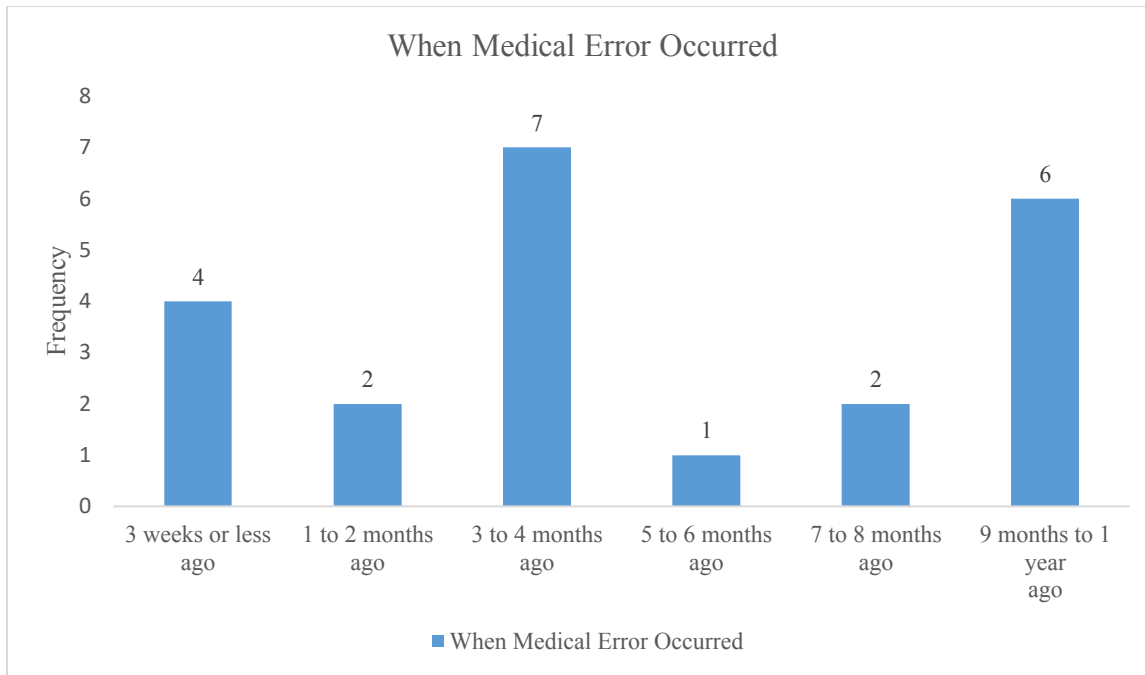
Figure 3: Medical Error Occurrence Timeframe

Of the items in the negative affect scale, the feeling that was reported as the strongest after the medical error was "upset" ($M=$ 3.45, $SD=$ 1.14), closely followed by "distressed" ($M=$ 3.27, $SD=$ 1.24), and "guilty" ($M=$ 2.77, $SD=$ 1.38). Table 1 can be referenced for descriptives of the remining scale items. Along with reporting the extent to which they felt each feeling from the scale, participants were also asked to answer when, post-error, they began having these feelings. As can be seen in Figure 4, the majority of participants felt them immediately after the error. This is true across all ten items.

Table 1: Negative Affect Item Means and Standard Deviations

	M	*SD*
Afraid	2.27	1.12
Jittery	2.05	1.05
Nervous	2.55	1.18
Ashamed	2.41	1.30
Irritable	2.09	1.15
Hostile	1.64	1.05
Scared	2.23	1.51
Guilty	2.77	1.38
Upset	3.45	1.14
Distressed	3.27	1.24
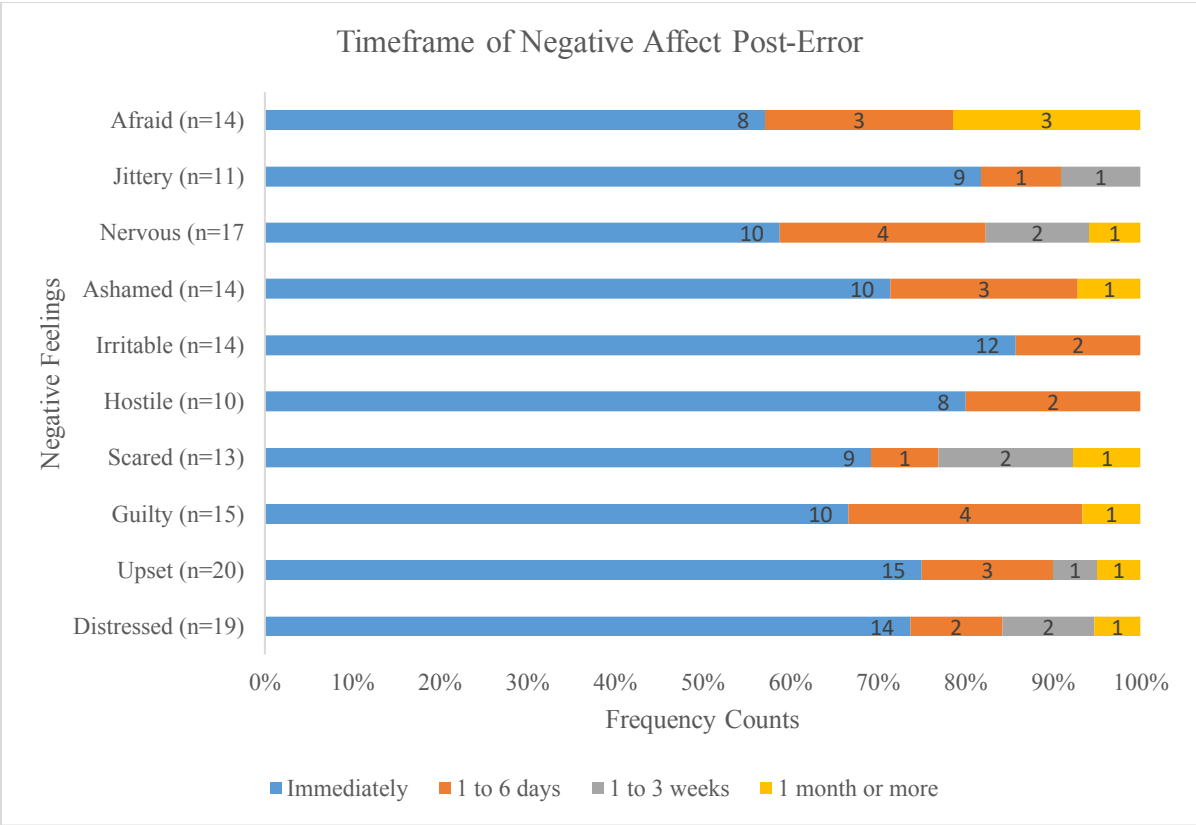
Figure 4: Negative Affect Timeframe

Significance Testing

Intercorrelations between negative affect, resilience, self-efficacy, work meaningfulness, perceived co-worker support, and perceived organizational support can be seen in Table 2. To analyze Hypothesis 1, a Bivariate Pearson product-moment correlation was computed to assess the relationship between resilience and negative affect post-error. Hypothesis 1 was supported, with results indicating that a significant moderate negative relationship exists between resilience and negative affect ($r = -.45$, $p < .05$), such that when participants reported higher levels of resilience, negative affect was lower.

Table 2: Intercorrelations of Variables

	M	SD	1	2	3	4	5
1. Negative Affect	2.45	.78					
2. Resilience	40.32	5.18	-.45*				
3. Work Meaningfulness	4.31	.71	-.51*	.77**			
4. Self-Efficacy	4.24	.63	-.58**	.83**	.73**		
5. Co-worker Support	3.94	.48	-.34	.41	.29	.51*	
6. Organizational Support	3..69	.63	-.12	.37	.37	.36	.53*

Note. *p<.05; ** p<.01

In order to analyze Hypotheses 2 through 5, model one from Hayes' PROCESS macro version 3.3 was used for each moderator. The confidence intervals were set at 95% and the number of bootstrap samples were left at 5,000, as recommended (Hayes, 2013). The predictor variable for all four analyses was resilience, while the criterion was negative affect. First, both individual factors (i.e., work meaningfulness and self-efficacy) were tested, followed by the analyses of external variables (i.e., perceived organizational support and co-worker support).

In testing work meaningfulness as a moderator, the overall model was not significant [$F_{(1,18)}$= 2.46, p<.10, R^2= .29], thus, Hypothesis 2 was not supported. In this model, resilience [b = -.11, $t(18)$ = -.84, p>.05, CI: -.38, .16], meaningfulness of work [b = -1.16, $t(18)$ = -1.14, p>.05, CI: -3.29, .97], and the interaction between the two variables [b = .02, $t(18)$ = .73, p>.05, CI: -.04, .08] did not significantly predict negative affect.

Results did not provide support in the Hypothesized direction when self-efficacy was tested as a moderator, but the overall model was significant in a positive direction [$F_{(1,18)}$=

3.31, p=.04, R^2= .36]. Therefore, Hypothesis 3 was not supported. Despite overall model significance, resilience scores alone did not significantly predict negative affect [b = -.06, $t(18)$ = -.46, p>.05, CI: -.36, .23], nor did self-efficacy [b = -1.62, $t(18)$ = -1.23, p>.05, CI: -4.39, 1.15]. Additionally, the interaction between resilience and self-efficacy was not shown to be significant [b=.02, t(18)=.62, p>.05, 95% CI: -.05, .09].

After testing the individual factor hypotheses, both external factor hypotheses were also analyzed. In testing perceived organizational support as a moderator, results revealed that the model was not significant [$F(1,18)$= 2.46, p<.10, R^2= .29], thus, Hypothesis 4 was not supported. Similarly, co-worker support did not moderate the resilience-to-negative affect relationship, as shown by the overall model [$F(1,18)$= 2.29, p>.10, R^2= .28], thus, Hypothesis 5 was not supported.

Although the proposed hypotheses for moderator variables were not supported, significant correlations (as seen in Table 2) can be seen in the predicted direction for individual factors. There was a large positive correlation between resilience and work meaningfulness (r = .77, p<.01), as well as resilience and self-efficacy (r = .83, p<.01). Yet, negative affect was negatively related to work meaningfulness (r = -.51, p<.05) and self-efficacy (r = -.58, p<.01).

CHAPTER FIVE: DISCUSSION

<u>Summary of Findings</u>

Overall, the aim of the present work was to test five hypotheses. The first major research question aimed to determine whether a relationship exists between resilience and negative affect experienced post-error. Results supported this notion as when participants reported higher levels of resilience, they also reported experiencing negative feelings to a lesser extent than those who reported lower levels of resilience. This highlights the fact resilience is an important variable to consider in second victim situations. The variables predicted to moderate the supported relationship did not impact the resilience-to-negative affect relationship, unlike predicated.

However, when looking at the correlation table (Table 2), as mentioned above, both individual factors, self-efficacy and work meaningfulness, were significantly highly correlated with resilience and negative affect. The direction of these correlations suggests that when work was perceived to be highly meaningful, resilience was also higher and negative affect lower. Similarly, when individuals reported having high self-efficacy, resilience was also higher and negative affect lower.

Although the P values for the moderating variables did not indicate significance, given the small sample size, it is important to consider the effect sizes of the regression models. According to Sullivan and Feinn (2012) small, medium, and large effect size indices for for R^2 are .04, .25, and .64, respectively. The authors have posited that while a P value can inform as to whether or not an effect exists, it does not indicate the size of the effect. They also stated that relying heavily on P value can also be faulty given that studies with very large sample sizes tend to result in significant P values. As can be seen in from the R^2 in the four models, all effect sizes

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are above .25, pointing to a medium effect sizes, which suggests that resilience and the proposed moderators, when analyzed in isolation, could account for more than 25% of the variance with regard to their impact on negative affect. Given the inconclusiveness of these findings, further research is recommended in order to explore the relationships proposed herein.

<div align="center">Limitations</div>

As with any research studies, the present work has its limitations. First, the sample size was very low for the type of statistical tests that were conducted. Prior to beginning the research, a G*Power analysis was calculated, which suggested a sample size of 119 participants. All efforts were made to obtain the largest sample size possible. Unfortunately, due to time constraints, busy schedules of healthcare professionals, and the error occurrence requirement, the final sample size was not ideal. This could be a potential reason for why the moderator hypotheses were not supported, yet the correlations for individual factors showed support in the proposed directions when analyzed independently.

Another limitation to this study is that participants were asked to recall an error that occurred in the past. It is possible that their memory of the event and their feelings about it are not accurate. Additionally, the moderator variables were asked about at a general-level rather than in the context of the time of the error. It is possible that these variables were less salient to them at the time of response compared to having been asked immediately after the error occurred. For instance, it will be difficult for someone to recall how much organizational support was present at the time of the error. There was an attempt to mitigate this by providing the timeframe of an error that occurred within the last year. This way, participants knew to think of an event that might be more recent compared to one that occurred earlier on in their careers. The

timeframe could have been made shorter (e.g., 6 months), but this posed an issue given the potential of ending up with a lower sample size do to a greater chance of disqualification from the survey.

Given that this was a cross-sectional study, cause and effect cannot be determined with certainty. It is not known whether individuals are more resilient due to high levels of work meaningfulness and high self-efficacy, or if believing work is more meaningful and having high self-efficacy are due to being more resilient. This is especially true given that participants were asked to answer the questions for these scales as they relate to their work. However, there was an attempt to mitigate this issue with regard to the dependent variable, negative affect. Although answers were still collected during the same survey session, the survey instructions specifically reminded respondents to think back to the time of the error when answering questions related to affect.

The final limitation is that this study still included participants who classified their error as not having reached the patient. In other words, this is a near-miss experience. By definition, second victims are victimized and traumatized by the error they experienced (Scott et al., 2009). It is not as likely that a person would experience the same level of negative affect, much less trauma, for such an error compared to one that caused the patient permanent harm or death. Conversely, given that the results showed a negative relationship between resilience and negative affect, regardless of the error severity, this highlights the importance of studying all types of errors. Similar to the reasoning provided above, disqualification of these individuals could have resulted in a lower response rate.

<u>Implications and Future Research</u>

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Given that, based on the literature review conducted, other research has not examined resilience as it relates to second victims, this study contributes new results to the field. Although there is still work to be done in this area, this study points researchers in the direction to finding answers that will lead to understanding the phenomenon of second victims and how to help these individuals, post-error. As found in previous work and in the current effort, there are negative feelings that manifest after an error occurs. This can lead to cognitive, physical, and behavioral problems (Seys et al., 2013) that can impact individuals personally and professionally. If action is not taken, these issues can contribute to more errors in the workplace (Seys et al., 2013), perpetuating both the issue of second victims and patient safety.

With a large enough sample size, future research could look at the relationships that were proposed in the present work, but consider the severity and timing of the error. It's possible that these relationships might not be significant for lower level errors, but may hold true for severe errors as they would have a greater impact on the healthcare professional. Similarly, future research should compare differences between those who committed versus witnessed an error as either can be second victims but may be impacted by the error in a different way. Additionally, the present study only examined healthcare professionals in one department, but differences among departments and position type (e.g., nurse, physician, resident, etc.) can also be examined as these may differ on a number of factors including climate and support. Conducting research that examines these differences can help identify which individuals are demographic groups are more likely to be second-victims and, therefore, allow management to intervene when necessary.

Given that the current work examined which emotions were the most prevalent, the results can help hospitals be more aware of how to develop interventions to help with the issue of

second-victims. Also, knowing the point in time that is most prevalent for the feelings helps them prepare and anticipate when to offer medical professionals with help after major incidences. Hospitals would benefit from future research examining other dependent variables. Only items within the negative affect scale were analyzed in the present work, but more issues that stem from committing errors can be explored.

Conclusion

The purpose of this study was highlight the importance of second victims and contribute not only to related literature, but also to the patient safety literature, in general, as healthcare professionals are a vital component of patient safety. Overall, although the sample size was low, this research filled a gap that has not been analyzed before and that is the relationship of resilience and affect as it relates to second victims. The present study acts as a precursor for continuing to explore factors that might play a role in aiding with negative feelings and emotions felt by second-victims. Overall, there are still many questions that require future research in order to be answered, but this study has underscored the importance of second victims and factors that could be related to the negative feelings that result from errors committed or witnessed.

APPENDIX A: SCALE ITEMS

Positive Affect Negative Affect Scale (PANAS)

Instructions: Think back to the time of the error. Please rate the extent to which you felt the following feelings and emotions after the error was made:

1= Very slightly or not at all
2= A little
3= Moderately
4= Quite a bit
5= Extremely

_ interested	_ irritable
_ distressed	_ alert
_ excited	_ ashamed
_ upset	_ inspired
_ strong	_ nervous
_ guilty	_ determined
_ scared	_ attentive
_ hostile	_ jittery
_ enthusiastic	_ active
_ proud	_ afraid

Instructions: Please think about your work as you answer the following questions.

General Self-Efficacy Scale

1. I will be able to achieve most of the goals that I have set for myself.
2. When facing difficult tasks, I am certain that I will accomplish them.
3. In general, I think that I can obtain outcomes that are important to me.
4. I believe I can succeed at most any endeavor to which I set my mind.
5. I will be able to successfully overcome many challenges.
6. I am confident that I can perform effectively on many different tasks.
7. Compared to other people, I can do most tasks very well.
8. Even when things are tough, I can perform quite well.

Co-worker support

1. My coworkers go out of their way to make my life easier.
2. It is easy to talk with my coworkers.
3. My co-workers can be relied on when things get tough for me at work.
4. My co-workers are willing to listen to my personal problems.
5. My co-workers respect me.
6. My coworkers appreciate the work I do.

Perceived Organizational Support

1. My organization considers my goals and values
2. My organization really cares about my well-being

3. My organization shows little concern for me (R)
4. My organization would forgive an honest mistake on my part
5. My organization cares about my opinion
6. If given the opportunity, my organization would take advantage of me (R)
7. Help is available from my organization when I have a problem
8. My organization is willing to help me when I need a special favor

Connor-Davis Resilience Scale 10

1.I am able to adapt when changes occur
2.I can deal with whatever comes my way
3.I try to see the humorous side of things when I am faced with problems
4.Having to cope with stress can make me stronger
5.I tend to bounce back after illness, injury of other hardships
6. I believe I can achieve my goals, even if there are obstacles
7.Under pressure, I stay focused and think clearly
8. I am not easily discouraged by failure
9.I think of myself as a strong person when dealing with life's challenges and difficulties
10.I am able to handle unpleasant or painful feelings like sadness, fear, and anger

Work Meaningfulness

1.The work I do is very important to me
2.My job activities are personally meaningful to me
3.The work I do is meaningful to me

APPENDIX B: UCF IRB LETTER

Institutional Review Board
FWA00000351
IRB00001138Office of Research
12201 Research Parkway
Orlando, FL 32826-3246

ACKNOWLEDGEMENT OF RELIANCE ON AN EXTERNAL IRB

July 18, 2019

Dear Shawn Burke:

On 7/18/2019, the IRB Office reviewed the updated information for the following study that is relying on an external IRB as the IRB of record:

Type of Review:	IRB Site
Title:	Second-Victims
Investigator:	Shawn Burke
IRB ID:	STUDY00000710
Funding:	None
Grant ID:	None
IND, IDE, or HDE:	None

This notification serves to acknowledge your conditional approval of the request to rely on the Greenvile Health Systems as the IRB of record for the above listed study and does not constitute an approval to conduct the research. The Greenville Health Systems review and approval of the study is required prior to study initiation.

For official determination, please provide the UCF IRB the documents as requested.

Sincerely,

Adrienne Showman
Designated Reviewer

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