The Crossroads of Wellness and Second Victim Syndrome: Identifying Factors that Alter the Pathway of Caregiver Recovery Following an Unanticipated Adverse Patient Outcome

Kimia Zarabian, BS1, A. Katharine Hindle, MD2, Ivy Benjenk, MPH2, Anita Vincent, MD2, Jamil M. Kazma, MD1, Benjamin Shambon, BS3, Raymond Pla, MD3, Eric Heinz, MD, PhD2

Abstract

Introduction: Second Victim Syndrome (SVS) describes the phenomenon in which a caregiver experiences a traumatic psychological and emotional response to an adverse patient event or medical error. Using quantitative survey analysis, we aim to better understand the personal factors that affect SVS development and recovery.

Methods: Caregivers at a small urban academic medical center who had experienced an adverse patient event in the past six months were invited to take part in this institution-wide, voluntary, quantitative, cross-sectional study. Three surveys were administered; the Holmes-Rahe Life Stress Inventory (HRLSI) was used as a surrogate to measure stressful life events. The Impact of Event Scale- Revised (IES-R) was used as a measure of the stress a provider senses following a traumatic event. The Second Victim Experience and Support Tool (SVEST) was used to assess the medical provider’s emotional response and level of institutional support in response to an adverse clinical event.

Results: Analysis of SVEST vs. IES-R demonstrated that respondents with greater self-perception of personal distress reported increased psychological (p=0.0008) and physical (p=0.0015) distress. Respondents who reported higher HRLSI scores had a greater perception that non-work-related support (p=0.04) such as family support was inadequate; however, these respondents were less likely to perceive institutional support (p=0.04) as inadequate. The results indicate that caregivers with more perceived life stresses believe that they do not have strong non-work-related support services, which is a known protective factor; thus, they may perceive any institutional support as more adequate.

Conclusion: This study suggests that personal life risk factors, institutional support, and non-work related support may play an important role in the development of SVS and the perception of stress and wellness in the setting of SVS.

INTRODUCTION

Altruism is one of the major driving forces in a caregiver’s decision to pursue a career in healthcare. The desire to help others in a time of need drives medical students to spend innumerable hours in the anatomy lab, in the medical school library, and in clinical wards. The Hippocratic Oath imparts the value of altruism and is built upon the dictum “do no harm.” However, inadvertent medical errors that result in patient harm are a reality. Current studies suggest that medical errors result in 210,000 to 440,000 deaths in the United States each year [1]. Albert Wu states “Physicians will always make mistakes. The decisive factor will be how [they] handle them” [2].

In 2000, Albert Wu coined the term “Second Victim” to describe the provider who is emotionally traumatized by a clinical situation resulting in an adverse patient outcome, and who is further harmed by a lack of institutional support to aid in the aftermath. Previous studies have found the prevalence of this phenomenon, known as “Second Victim Syndrome (SVS)” to be between 10.4% and 43.3% in caregivers who are involved in an adverse clinical event [3]. Most known risk factors for the development of SVS are directly related to the patient, or “first victim,” rather than the provider. These patient-based risk factors include adverse outcomes relating to a young or healthy patient, multiple patients, or a devastating outcome of the error [4]. However, two potential risk factors directly relating to the medical provider rather than the patient have been identified: female sex and the degree of perceived personal responsibility [5, 6]. Other determined factors that impact the outcome of SVS are based on the medical institution’s response to the error [5]. The most common psychological manifestations of SVS include anxiety, guilt, and grief, and many second victims may suffer from chronic depression or PTSD as a direct result [5]. Furthermore, second victims can experience caregiver burnout, a topic that has gained much attention from the medical and lay communities [3]. External factors such as work overload, lack of control, breakdown of community, and conflicting values affect the development of burnout [7]. Family problems increase risk of physician burnout, whereas a supportive home life is protective [7, 8]. Therefore, external factors may have profound effects on how a healthcare provider copes with the stress of work. To the same degree, external

*Correspondence To: Kimia Zarabian
Email: kzarabian@gwu.edu

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personal factors and environment, such as a practitioner’s psychosocial status at the time of the event, may impact the way in which a provider manages an adverse patient outcome [9].

Previous studies that have been done on SVS are ex post facto, focused on treating the provider in the emotional aftermath of the event. Identifying factors that worsen or prolong the effects of this syndrome may prove to be protective in mitigating the outcome for the provider. Our objective is to evaluate these risk factors in order to enhance our understanding of the relationship between life events and adverse patient outcomes in the workplace. With this insight, caregivers who may be at risk for SVS can be identified before any potential adverse patient outcomes, and interventions can be initiated to help avoid potential traumatic psychosocial responses.

METHODS
Settings and Participants
This study was conducted at a small urban academic medical center. The survey was widely publicized electronically throughout the institution, and those who had experienced an adverse patient event in the past six months were invited to take part in this voluntary quantitative cross-sectional study. Three surveys were administered to participants to evaluate caregivers’ levels of stress at the time of the event, to determine the psychosocial impact of the event, and to investigate the caregivers’ desired support mechanisms. Participants were compensated for their time with a gift card. Because the survey was administered at a small academic institution, no identifying factors were asked or reported from participants to ensure anonymity. This study was deemed exempt by our Institutional Review Board.

Survey Tools
The online survey administered to participants contained three validated tools that evaluated caregivers’ levels of stress at the time of the event, the psychosocial impact of the event, and the caregivers’ desired support mechanisms. The validated tools were provided in the same order to all participants for survey consistency.

The Second Victim Experience and Support Tool (SVEST) is a validated 29 question survey to assess the medical provider’s emotional response and level of institutional support in response to an adverse clinical event [10]. The SVEST measures fields including psychological distress, physical distress, colleague support, supervisor support, institutional support, non-work-related support, professional self-efficacy, turnover intentions, absenteeism, and desired form of support [10]. Participants ranked each field on 5-point Likert scales, ranging from “strongly disagree” to “strongly agree.” Previous studies have used the SVEST to assess patient safety culture and the need for implementing support programs for second victims to make healthcare safer [11, 12]. The SVEST has been adopted globally to measure Second Victim Syndrome [13,14].

The Holmes-Rahe Life Stress Inventory (HRLSI), previously referred to as the Social Readjustment Rating Scale (SRRS), consists of 43 different life events that are measured in Life Change Units (LCU) for level of stress induction and are predictors of illness due to increased stress [15, 16]. Each life event is ranked with relative “weight” for stress - more events indicate a higher HRLSI score [16]. Among the highest ranked life events are death of a spouse, divorce, marital separation, jail term, death of a close family member, and personal injury or illness [15]. According to the Holmes-Rahe prediction model, a score below 150 LCU indicates a relatively low amount of life change and a low (30%) susceptibility to stress-induce health problems [16]. A score of 150 to 300 LCU indicates a 50% chance of a major stress-induced health problem in the next 2 years [16]. A score of 300 LCU or more indicates an 80% chance of a major stress-induced health problem in the next 2 years [16]. The HRLSI inventory has additionally been recognized as a potential tool to identify suicide attempters, measure maternal-fetal health, and assess autoimmune dysfunction [17-19].

Lastly, the Impact of Event Scale-Revised (IES-R) is a 22 question survey to measure the level of personal distress the caregiver endured following the event [20]. The IES-R is not a diagnostic tool, but has been validated and used as a measure of PTSD in numerous studies on medical injuries and immune suppression [21-25]. Each survey question is rated on a 5-point scale ranging from 0 to 4 in order to determine the presence of three main PTSD symptom categories or subscales: intrusion, avoidance, and hyperarousal [20]. The IES-R contains 8 questions related to the intrusion category, 8 questions related to avoidance, and 6 questions related to hyperarousal [20]. The recommended method of calculation is to sum the means of each subscale to obtain the total score [20]. While there is no cut-off score, a score greater than 1 indicates a moderate to severe level of personal distress [20]. We used this method in our main analysis.

Another proposed method of calculating IES-R is through summation of raw score for each item [23-25]. A raw score above 22 may reflect significant PTSD concerns, while scores above 39 may reflect significant immune system suppression; yet, these cutoffs vary across studies [23-25]. We discuss this method to evaluate for significant immune suppression.

Data Collection
Survey results were de-identified through the use of REDCap electronic data capture tools. REDCap (Research Electronic Data Capture) is a secure, web-based application designed to support data capture for research studies, providing 1) an intuitive interface for validated data entry; 2) audit trails for tracking data manipulation and export procedures; 3) automated export procedures for seamless data downloads to common statistical packages; and 4) procedures for importing data from external sources.

Surveys were excluded from analysis if responding participants did not meet the pre-screening criteria of adverse event in the last 6 months or if one or more sections of the surveys were incomplete.

Figure 1: Description of inclusion flow diagram.
A total of 208 survey responses were received. After analysis for completion of required survey elements, 98 surveys were excluded due to lack of pre-screening criteria, such as lack of involvement in an adverse event. Of the remaining who consented, 35 submitted blank or incomplete surveys. Thus, a total of 75 valid entries for SVEST and HRLSI inventory scores and 70 valid entries for IES-R were received.
Data Analysis

Primarily, we calculated each individual’s SVEST, HRLSI, and IES-R surveys scores. T-test analyses of the survey results were conducted in order to assess for statistical significance between the various groups. SVEST categories were evaluated against IES-R values; the fields examined included IES-R ≤ 1 and IES-R>1. SVEST categories were additionally evaluated against HRLSI scores, with the fields HRLSI <150 and HRLSI ≥150. Furthermore, IES-R subgroups were evaluated against HRLSI categories with the same fields above. Results were obtained and are presented below. Analyses were run through Stata statistical software. All p values were significant at <0.05.

RESULTS

Tables 1 and 2 demonstrate demographics of survey respondents. Results of the HRLSI reveal a reported range of 0 LCU to 410 LCU, a 50th percentile score of 112 LCU, and a mean score of 127.7 LCU (Table 1). The highest weighted item reported was divorce (weighted at 73), while the item most commonly reported was vacation (weighted at 35). Only 38.7% of respondents scored HRLSI≥150 and 42.9% had IES-R>1 (Table 2). Furthermore, 60% of respondents had a raw score of less than 22, 28.6% had a raw score of 22-38, and 11.4% had a raw score of 39 or greater, which is discussed below as a measure of PTSD.

Table 3 (next page) describes the comparison of SVEST scores, IES-R scores, and HRLSI scores. In the SVEST vs IES-R≤ 1 and IES-R>1 analysis, the psychological distress (p=0.0008) and physical distress (p=0.0015) categories demonstrated statistically significant differences. Mean value for psychological distress in IES-R≤1 (2.89±1.06, p=0.0008) was found to be less than that of IES-R>1 (3.69±0.85, p=0.0008). Similarly, mean value for physical distress in IES-R≤1 (2.19±0.95, p=0.0015) was less than that of IES-R>1 (2.93±0.88, p=0.0015).

Additionally, the institutional support (p=0.04) and non-work-related support (p=0.04) categories in the SVEST vs HRLSI≥150 and HRLSI≥150 analysis demonstrated statistically significant differences (Table 3). Mean value for institutional support in HRLSI<150 (3.07±0.69, p=0.04) was found to be greater than that of HRLSI≥150 (2.79±0.47, p=0.04). In contrast, mean value for non-work-related support in HRLSI<150 (3.66±1.10, p=0.04) was less than that of HRLSI≥150 (4.15±0.87, p=0.04).

The remaining categories of SVEST in comparison with HRLSI and IES-R groups were not found to have statistically significant differences. Similarly, results for IES-R PTSD subgroups were not statistically significant.

DISCUSSION

The goal of this study was to assess the effects that personal factors have on the second victim experience and recovery from an adverse patient event. The results of the quantitative survey analysis suggest that our population most commonly perceived a lack of supervisor and colleague support in response to the adverse event. This may indicate that the response of the workplace plays an important role in the development and aftermath of SVS. Furthermore, respondents with self-perception of higher life stress reported increased psychological and physical distress, and also perceived that non-work-related support was inadequate; however, this same group was less likely to perceive institutional support as inadequate.

Although all providers within the medical system can experience SVS, medical residents who perceive that they have made an error are particularly vulnerable to this phenomenon and experience significant distress. [26, 27] Thus, recognizing those at risk for SVS and those who will have more difficulty recovering is essential for harm reduction and caregiver wellness.

| HRLSI Category       | Life Change Units | Number Reported | HRLSI Category       | Life Change Units | Number Reported |
|----------------------|-------------------|-----------------|----------------------|-------------------|-----------------|
| Death of spouse      | 100               | 0               | Son or daughter leaving home | 29                | 2               |
| Divorce              | 73                | 1               | Trouble with in-laws   | 29                | 6               |
| Marital separation   | 65                | 1               | Outstanding personal achievement | 28                | 11              |
| Jail term            | 63                | 0               | Spouse beginning or ceasing work outside the home | 26                | 10              |
| Death of a close family member | 63        | 13              | Beginning or ceasing formal schooling | 26                | 3               |
| Major personal injury or illness | 53       | 8               | Change in living conditions | 25                | 9               |
| Marriage             | 50                | 4               | Revision of personal habits | 24                | 5               |
| Fired at work        | 47                | 0               | Troubles with boss      | 23                | 9               |
| Marital Reconciliation | 45            | 1               | Change in work hours or conditions | 20                | 19              |
| Retirement           | 45                | 0               | Change in residence     | 20                | 14              |
| Major change in health of family member | 44       | 17              | Changing to new school  | 20                | 3               |
| Pregnancy            | 40                | 7               | Changes in recreation   | 19                | 17              |
| Sexual difficulties  | 39                | 6               | Change in church activity | 19               | 4               |
| Gaining new family member | 39        | 6               | Change in social activities | 18               | 7               |
| Business readjustment | 39               | 7               | Mortgage or loan less than $10,000 | 17            | 7               |
| Change in financial state | 38         | 11              | Change in sleeping habits | 16                | 15              |
| Death of a close friend | 37               | 7               | Change in eating habits  | 15                | 13              |
| Changing to different line of work | 36     | 8               | Change in number of family get togethers | 15               | 11              |
| Change in number of arguments with spouse | 35       | 9               | Vacation                | 13                | 35              |
| Mortgage over $10,000 | 31               | 5               | Major holidays          | 12                | 26              |
| Foreclosure of mortgage or loan | 30       | 0               | Minor violations of the law | 11               | 9               |
| Change in responsibilities at work | 29     | 26              | HRLSI Totals: Range: 0 LCU-410 LCU | Median: 112 LCU  | Mean: 127.7 LCU|

Table 2: HRLSI (n = 75) and IESR (n = 70) Scores

| HRLSI Scores (%) | < 150 | 61.33% |
|------------------|-------|--------|
|                  | ≥150  | 38.67% |
| IESR Scores (%)  | < 1    | 57.1%  |
|                  | >1    | 42.9%  |
It has long been understood that stress, especially when chronic, has an adverse impact on somatic and psychiatric wellbeing. This is especially significant in the field of healthcare where job-related stressors can have negative effects on mental and physical health along with decreased engagement and patient outcomes [28, 29]. The HRLSI results suggest that about 38.7% of respondents have a 50% chance or greater risk of developing a major stress-induced health problem in the next 2 years. Furthermore, one participant scored 410 LCU, indicating an 80% chance of developing a major stress-induced health problem in the next 2 years.

Post-traumatic stress disorder (PTSD) is a significant chronic outcome of stress in healthcare workers. It is estimated that about 15% to 25% of healthcare workers suffer from PTSD [30]. Commonly reported symptoms of PTSD can be categorized as intrusive, avoidance, negative symptoms or hyperarousal [20]. Intrusive symptoms refer to intrusive mental imagery and feelings associated with the traumatic event [20, 31]. Avoidance can be characterized by avoidance of feelings, ideas, and triggers relating to the traumatic event [20, 31]. Negative symptoms refer to negative feelings such as anger, guilt, and shame as a direct result of the traumatic event [31]. Hyperarousal refers to symptoms such as insomnia, loss of concentration, extreme irritability, or even violent behavior [20, 31].

The PTSD symptoms associated with SVS can cause adverse health outcomes for second victims, including devastation of the immune system, coronary artery disease, psychosomatic syndromes, metabolic syndromes, depression, substance abuse, and numerous other physical conditions [32-35]. The IES-R results reveal that 42.9% of respondents had a mean score of greater than 1, placing them at a moderate to severe level of personal distress. Even more alarming is that 28.6% of our respondents raw scores indicated that they were at risk of developing clinical signs of PTSD.

Notably, 11.4% of individuals had a raw score of 39 or greater on the IES-R, suggesting potentially significant decreased immune system function in the future. PTSD’s role in suppressed immune function may occur through various mechanisms, including alteration of DNA methylation and epigenetic analysis reveals an alteration in immune system-specific genes and miRNA expression in patients with PTSD when compared to those without PTSD, suggesting that PTSD instigates changes to the human body at the molecular level [36].

Furthermore, PTSD may be associated with a T cell phenotype that is consistent with increased differentiation of T cells and interpreted as early aging of the immune system [37]. The process of cellular aging and telomere shortening have also been implicated in adverse immune system outcomes [37]. The results of the SVEST and HRLSI analysis demonstrated that respondents who had higher HRLSI scores (i.e. higher stress level) had statistically significant higher perception that non-work-related support, such as family support, was inadequate. In contrast, those with higher HRLSI were less likely to perceive institutional support as inadequate. This suggests that caregivers with more perceived life stresses may not have strong support.
non-work-related support services, which is a known protective factor; thus, they may perceive any institutional support as more adequate, thus highlighting the importance of a support network outside of the workplace. Although the lack of institutional or non-work related support may only be a perception, perception often lends insight into reality and can allow for understanding who is at higher risk of SVS, burnout, and health-related consequences. Institutions likely need to do more for this group, as these victims do not have the personal safety net to support them during the aftermath of an adverse event.

The National Academies of Sciences, Engineering, and Medicine recommend for institutions to combat adverse outcomes and healthcare burnout by creating positive work and learning environments, promoting skilled communication, reducing the administrative burden of healthcare workers, investing in research on the efficacy of burnout reduction methods, reducing the stigma of seeking support, and eliminating barriers for healthcare workers to obtain support [38, 39]. Institutions should ensure that appropriate workplace support systems, such as employee assistance programs, peer support/responder programs, and mental health providers, are in place and accessible to second victims [38–40]. Legal protections may further be implemented to allow healthcare workers to seek and receive help for mental health and emotional concerns without concern for malpractice litigation [38].

This study is especially pertinent for caregivers practicing in the midst of a pandemic. In particular, caregivers who witness the realities of higher fatality rates and adverse outcomes of the COVID-19 pandemic are susceptible to SVS. At the same time, less resources are available as they navigate this novel disease. Considering the multifaceted characteristics of stress-induced healthcare issues and their magnifying costs, it is important to recognize possible methods of reducing the negative effects of SVS through early prevention programs, reformed organizational structure, increased access to mental health services, and many others. Burnout from SVS can cause more medical errors to occur and can further propagate SVS, creating an endless cycle of harm to both patient and provider.

LIMITATIONS

This study was limited by the number of surveys received and the small sample size, as only a small number of caregivers experienced adverse events. The survey order was kept consistent for all participants, which may have led to incompletion of the final survey due to fatigue. The study was performed at a single center; thus results may not be applicable to other populations. Per IRB mandate, no identifying information could be collected, hence no subgroup analysis could be completed. One of the limitations of the HRLSI is that each event is weighted according to what the original authors perceived as stressful events and was originally developed and verified on males. This assumption does not take into account the personal or cultural characteristics of the individuals. Despite this limitation, studies on the HRLSI have established its validity and consistency across various sexes and cultural characteristics [16]. Furthermore, IESR is limited, as it is a screening tool and does not hold clinical diagnostic capabilities.

Future studies must further assess the relationship between personal risk factors and the lifespan of SVS from development to recovery, as well as the chronic effects of SVS on individual providers and the institution. Historically, the healthcare system does not focus sufficient attention on provider wellbeing. Healthcare institutions must address the challenges that prevent second victims from recovery and must provide support mechanisms to ensure the wellness of their caregivers [41].

CONCLUSION

In this study, we aim to better understand the effects that personal factors have on the second victim experience after unanticipated adverse patient outcomes. Insight into these life aspects will allow for the development of strategies and support to ensure that all caregivers who experience adverse patient events will recover and thrive from the experience. The results of the SVST and HRLSI analysis demonstrated that respondents who reported higher life stress had statistically significant higher perception that non-work-related support, such as family support, was inadequate. In contrast, those who reported higher life stress were less likely to perceive institutional support as inadequate. This suggests that caregivers with more perceived life stresses may not have strong non-work-related support services, which is a known protective factor, highlighting the importance of a support network outside of the workplace. Institutions likely need to do more for this group, as these caregivers do not have the personal safety net to support themselves during the aftermath of an adverse event.

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