A Transactional "Second-Victim" Model—Experiences of Affected Healthcare Professionals in Acute-Somatic Inpatient Settings: A Qualitative Metasynthesis

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Background: "Second victims" are healthcare professionals traumatized by involvement in significant adverse events. Associated burdens, e.g., guilt, can impair professional performance, thereby endangering patient safety. To date, however, a model of second victims' experiences toward a deeper understanding of qualitative studies is missing. Therefore, we aimed to identify, describe, and interpret these experiences in acute-somatic inpatient settings.

Methods: This qualitative metasynthesis reflects a systematic literature search of PubMed, CINAHL, and PsycINFO, extended by hand searches and expert consultations. Two researchers independently evaluated qualitative studies in German and English, assessing study quality via internationally approved criteria. Results were analyzed inductively and aggregated quantitatively.

Results: Based on 19 qualitative studies (explorative-descriptive: n = 13; grounded theory: n = 3; phenomenology: n = 3), a model of second-victim experience was drafted. This depicts a multistage developmental process: in appraising their situation, second victims focus on their involvement in an adverse event, and they become traumatized. To restore their integrity, they attempt to understand the event and to act accordingly; however, their reactions are commonly emotional and issue focused. Outcomes include leaving the profession, surviving, or thriving. This development process is alternately modulated by safety culture and healthcare professionals.

Conclusions: For the first time, this model works systematically from the second-victim perspective based on qualitative studies. Based on our findings, we recommend integrating second victims' experiences into safety culture and root-cause analyses. Our transactional model of second-victim experience provides a foundation for strategies to maintain and improve patient safety.

Key Words: adverse events, human error, patient safety, safety culture, qualitative research

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K.V. declares that he is involved in training activities and research projects on Second Victims in Belgium, the Netherlands, and Italy. The other authors disclose no conflict of interest.

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The lead author (article's guarantor) affirms that this article is an honest, accurate, and transparent account of the study being reported; that no important aspects of the study have been omitted; and that any discrepancies from the study as planned (and, if relevant, registered) have been explained.

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The term "second victim" was introduced by Wu (2000), describing healthcare professionals traumatized via involvement in serious adverse events.[1,2] Having unintentionally caused harm to patients ("first victims"), many consider these events as personal failures, losing their confidence as clinicians and professionals.[1,2] However, in today's complex healthcare environments, eventual involvement in a serious adverse event is normal.[3] When adverse events—defined by their potential for harm[4]—affect patients, guilt, frustration, and fear can impair involved healthcare professionals' performance, further endangering patient safety.[3]

Hilfiker (1984)[5] and Leape (1994)[6] highlighted human fallibility in medical settings; and in 2000, the U.S. Institute of Medicine published "*To Err Is Human*."[7] That report estimated that up to 98,000 persons died annually in the United States from medical errors, leading to associated expenses as high as US $29 billion.[7] Current estimates place the annual death relating to adverse events up to 440,000.[8] However, even these figures are questionable, many cases go unreported, because therapy- and disease-related harms are often indistinguishable.[9] Internationally, although patient safety is a global priority, the incidence rate of adverse events is 14.2 per 100 hospitalizations per year in high-income countries.[10,11]

From 2009 to 2017, review articles focused on qualitative and quantitative second-victim studies of varying explanatory power in the United States, Asia, and Europe.[3,12–16] These indicated that second victims' experience intense emotional burdens (e.g., burnout and depression), impacting their personal relationships, their professional collaborations, their physical health, and even their institutions ("third victims").[3,12–14,16]

However, although supportive environmental conditions (e.g., support from colleagues) are beneficial, many institutional reactions simply compound the damage.[3,13] Ideally, care teams and superiors support their affected colleagues, whereas their organizations ensure that supportive structures are embedded in their safety culture.[3,12–16] Research has yet to identify how to relieve second victims' burdens while considering short- and long-term effects on safety culture.[3,12,15]

Within healthcare organizational culture, safety culture reflects management and staff values, attitudes, perceptions, competencies, and behaviors regarding individual fallibility.[17] Therefore, security-promoting behavior depends not only on individual character but also on collectively shared values.[18]

Although increasing numbers of differentiated, empirical studies illuminate second victims' experiences, no review article have systematically interpreted nor aggregated regarding theory formation and development. Moreover, shortages of theoretical associations often preclude in-depth understanding of interactions. Even though, e.g., Lazarus' stress model or Antonovsky's concept of salutogenesis help elucidate second-victim experience, e.g., by means of cognitive appraisals relating to stress or a jeopardized sense of coherence,[19,20] yet no available model explains the overall second-victim construct.

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Until now, strategies to maintain or improve patient safety have focused on affected patients. By shifting "from a personal to a systemic perspective," incident analyses and safety culture promotion become strategic pillars of patient safety.[21] Regarding healthcare priorities and lack of support for many second victims,[10,12–14,16] a model of their experience will, by increasing the visibility of the often neglected experiences of second victims, contribute to a higher level of awareness regarding this vulnerable group.

This qualitative metasynthesis is rooted in holistic thinking akin to pragmatism and aims to describe and interpret second victims' experiences in acute-somatic settings from this group's perspective. We approach experience as a learning process evolving and generating meanings between the individual and the context.[22–24]

METHODS

This qualitative metasynthesis follows the steps by Sandelowski and Barroso (2007)[25]: goal setting, literature search, evaluation of studies, classification of results, metasynthesis, and metasummary. The ENTREQ statement was used to ensure methodical rigour.[26]

Goal Setting and Literature Search

The SPIDER structure was used for goal setting and search string development (Table 1), referring to the keywords associated with Boolean operators, which were used to search in PubMed, CINAHL, and PsycINFO without temporal limitations (September 27, 2016, update: December 23, 2016).[27]

In addition, we searched reference lists of included studies, other systematic reviews, study protocols, professional publications, dissertations, and monographs, and contacted authors (n = 22).

We included original German and English articles offering insight into second-victim experience based on qualitative designs and conducted interviews, predominantly of healthcare professionals in acute care inpatient settings. We excluded studies in other languages, nonoriginal articles, mixed-methods studies, nonresearch-based articles, and first-level interpretations (e.g., interview transcripts).

Evaluation of Studies

For the initial screening, the first and fifth author independently checked all titles and abstracts according to predefined inclusion criteria. Next, they read potentially relevant full texts. For both steps, interrater reliability was determined.[28,29] We discussed discrepancies until we reached consensus.

For individual evaluation, following Sandelowski and Barroso's guidance, the authors read all included studies repeatedly with increasing attention to detail and wrote synopses of all.[25] For overarching conclusions, they tabulated and compared study evaluations.[25]

Classification of Results

The first author dichotomized the result sections of all included studies as first- or second-level interpretations and evaluated each one's methodology regarding design, sample, data collection, and analysis.[30] The fifth author verified 47% of these evaluations.

Metasynthesis

We performed an inductive qualitative data analysis using MAXQDA V.12.[31] "First-cycle coding" involved line-by-line micro-analysis of second-level interpretations of the included studies' results sections.[31] Via splitting, we grouped qualitative data into open, inductive single-word– or phrase-based codes.[31] "Second-cycle coding" differentiated categories by means of subcodes and codes.[31] This resulted in a conceptual model.[31]

Metasummary

To avoid underrating or overrating individual findings, we quantitatively aggregated qualitative data.[25] After extracting, paraphrasing, categorizing, and abstracting as parts of the metasynthesis described previously, we calculated via the following formulas by means of code frequencies, which results were the most frequent across the studies (frequency) and how much each study contributed to the analysis (intensity):

$$frequency = \frac{\text{number of publications of a certain category (n = 16)}}{\text{total number of publications (n = 19)}}$$

$$intensity = \frac{\text{number of categories per publication (n = 4)}}{\text{total number of categories (n = 5)}}$$

TABLE 1. Search String in PubMed, CINAHL, and PsycINFO

Concepts	Key Words Combined With Boolean Operators
Setting	"acute care" OR "acute care setting" OR "acute care settings" OR "acute setting" OR "acute settings" OR "clinic" OR "clinics" OR "hospital" OR "hospitals"
	AND
Population	"healthcare professional" OR "healthcare professionals" OR "healthcare provider" OR "healthcare providers" OR "resident" OR "residents" OR "second victim" OR "second victims"
	AND
Causes	"adverse event" OR "adverse events" OR "adverse patient event" OR "adverse patient events" OR "error" OR "errors" OR "mistake" OR "mistakes" OR "patient harm" OR "patient harms" OR "patient safety event" OR "patient safety events" OR "patient safety incident" OR "patient safety incidents" OR "unanticipated outcome" OR "unanticipated outcomes"
	AND
Evaluation	"affected" OR "anger" OR "anxiety" OR "burnout" OR "coping" OR "depression" OR "distress" OR "emotional" OR "experience" OR "fatigue" OR "fear" OR "feelings" OR "frustration" OR "guilt" OR "impact" OR "meaning" OR "psychological" OR "safety culture" OR "sleep" OR "stress" OR "support" OR "traumatic"
	AND
Design	"content analysis" OR "ethnographic study" OR "ethnography" OR "grounded theory" OR "interview" OR "interviews" OR "interviewed" OR "phenomenological study" OR "phenomenology" OR "qualitative study" OR "thematic analysis"

Author's own chart.

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Trustworthiness

To ensure our results' trustworthiness, we applied the descriptive, interpretative, theoretical, and pragmatic validity criteria by Sandelowski and Barroso.[25] The first author's in-depth familiarity with the second-victim issue contributed to his nuanced understanding of this subject. In addition, regular meetings within the research team contributed to this study's interpretative and theoretical validity. Furthermore, the comprehensive and systematic literature search, the metasummary, and the inclusion of studies with heterogeneous epistemiological bases strengthened the interpretative and theoretical validity. The research steps described previously further strengthened our results' descriptive and pragmatic validity.[25]

RESULTS

Included Studies

Evaluations of the chosen studies' titles and abstracts (Fig. 1) resulted in high interrater reliability ($k = 0.78$); full-text evaluations yielded near-perfect interrater reliability ($k = 0.96$), leading to inclusion of 19 studies.[2,33–50] For reasons of methodological quality, no studies were excluded (Fig. 2).[25]

The 19 between 1992 and 2016 published studies (explorative-descriptive studies,[2,33,34,36,37,40,44–50] grounded theories,[35,38,43] phenomenologies[39,41,42]) involved 478 predominantly medical or nursing healthcare professionals of both sexes ($n_{physicians} = 325$ and $n_{nurses} = 131$) in American ($n_{studies} = 9$), European ($n_{studies} = 8$), and Asian ($n_{studies} = 2$) hospitals. Despite diverse descriptions and definitions of adverse events, all focused on the healthcare professionals' response to actual or potential patient harm (Table 2).

Metasynthesis

Transactional Second-Victim Experience

Our metasynthesis outlined a transactional second-victim experience model (Fig. 3). Vertically, this represents a system open to external influences, with mutual modulation between *safety culture* and *healthcare professionals*. Due to reciprocity, indicated by arrows, *safety culture* is both a central influencing factor regarding affected *healthcare professionals* and an end point.

Horizontally, iterative development begins with *appraising the situation*, extending first to *restoring integrity*, then *continuing professional life*. Between *appraising the situation* and *restoring integrity*, *healthcare professionals weigh their internal and external resources*. For example, they activate personal resources and receive assistance from colleagues via *safety culture*.[50] However, although second victims often need support urgently[2,33,39,44–50] and search for "emotional relief valves,"[36,50] they tend to deny themselves such support via undemanding or unreceptive behavior.[33,35,40,42,47,49,50]

"Several claimed that they did not have any expectations about getting support because they had made a mistake, and therefore had to bear the consequences themselves."[47(p321)]

Safety Culture And Healthcare Professionals

S*afety culture* influences whether and to what extent *healthcare professionals* become second victims.[2,37,42,44,48–50] Acknowledgment of second victims' need for help is a first step toward overcoming the negative consequences of the "blame-shame culture" that dominates many institutions.[2,33,35,37,39,41,42,44,45,47,48,50]

Communicative processes are formative in a *safety culture*. For example, speaking to first victims can be therapeutic for second victims; however, emotional issues for both first and second

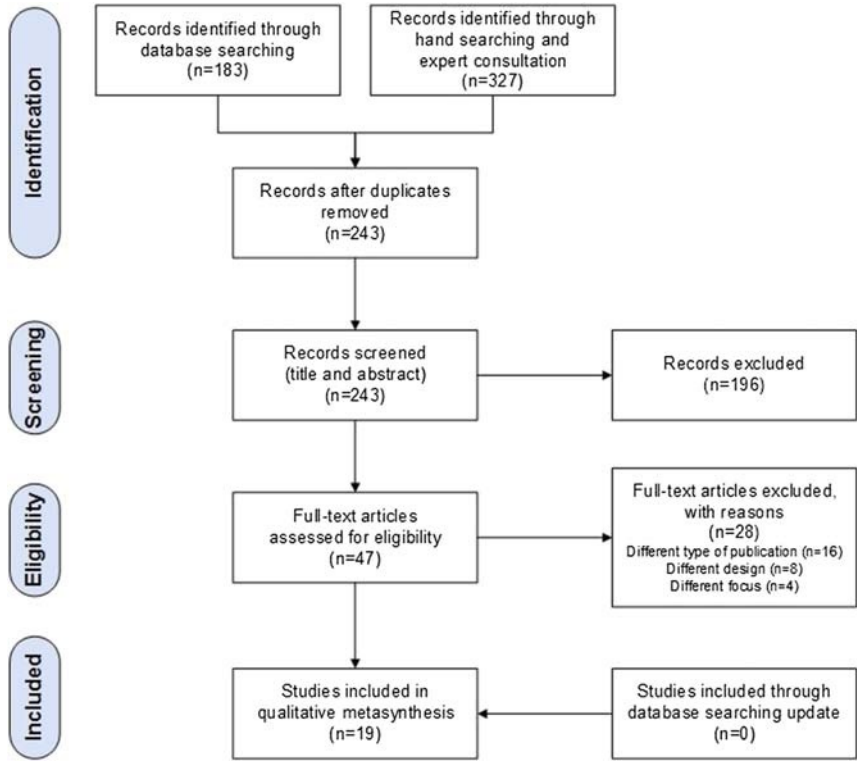

FIGURE 1. Flow diagram of included studies following Moher et al. (2009).[32]

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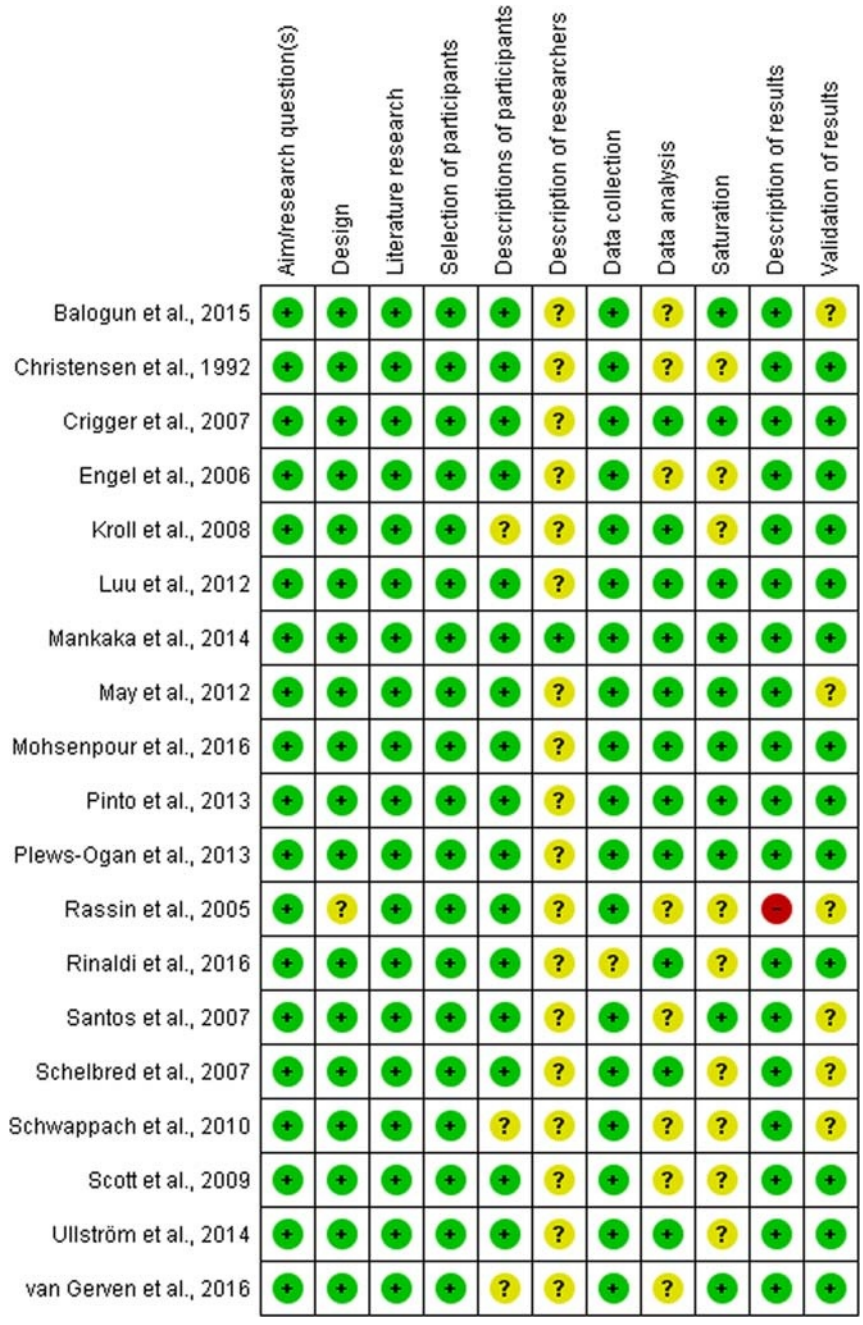

FIGURE 2. Methodological quality of included studies (author's own chart, elaborated by means of review manager 5.3, Nordic Cochrane Centre, 2014).

victims can make discussions challenging.[33,34,36,38–43,47] Considering second victims' damaged professional confidence, they often share their feelings with friends rather than medical professionals.[2,33,34,36–38,41–43,45,47–50] Although this informal support channel usually involves persons with no professional healthcare background,[34,36,47–50] the advantage of disclosing one's inner feelings and preserving a perspective "from the outside" can outweigh the disadvantages.[2,34,36] Whereas professional assistance offers both trustability and a neutral perspective, it can also be associated with stigmatization.[39,50] Although empathic and sympathetic team behaviors can benefit second victims, staying silent or minimizing an event can be regressive.[35,40,41,49] Likewise, within a robust *safety culture*, superiors can use adverse events to imprint that culture via role modeling,[39,47,48] e.g., cultivating a trustful, systemic perspective on errors, and addressing informational needs, e.g., concerning support programs.[2,38,40,45,46,48–50]

"The respondents within this study suggested that none of these support systems are possible if there is not an organizational patient safety culture."[50(p9)]

Depending on the event's seriousness, second victims are often eager both to learn and to contribute to safety culture via root-cause

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TABLE 2. Characteristics of Included Studies

Author/ Year	Design/Setting/ Country	Sample	Event	Aim/Research Question	Data Collection	Data Analysis	Results
Balogun et al., 2015[33]	*Design:* Explorative-descriptive qualitative design *Setting:* University hospitals (n = 6) *Country:* Canada	*Targeted sample:* 23 physicians, 27–37 y with various ethnic and religious background (assistant physicians n = 14; physicians in specialist training: n = 9; neurosurgery: n = 12; general surgery: n = 8; women: n = 7; men: n = 16)	*Catastrophic error events* defined as error events having entailed serious harm or having resulted in deaths	The aim was to understand the response and coping strategies of surgical assistants and to recommend possibilities of support.	Semi-structured individual interviews (n = 23)	Open and axial coding (Strauss et al., 1990)	Indications that catastrophic error events represent system deficits rather than individual errors. Despite experiencing a wide array of emotions, surgical assistance physicians learn from error events. Irrespective of highly valued mentoring relationships with senior staff, they do not feel safe enough to actively approach superiors. Consulting services should be at their disposal, probably offering a benefit. Surgical culture proved to be a barrier to help-seeking behavior as emotional vulnerability is often equated with personal weakness.
Christensen et al., 1992[34]	*Design:* Explorative-descriptive qualitative design *Setting:* Public hospital *Country:* United States	*Targeted sample:* 11 physicians with practical experience between 4 and 18 y (min. 4 y) (medical subspecialities: n = 7; general medicine: n = 3; women: n = 3; men: n = 8)	*Error events* individually defined by physicians	The aims were to describe how physicians think and feel about error events and to investigate which beliefs influence their emotional response.	Semi-structured individual interviews (n = 11)	Analysis according to guideline criteria	Indications that physicians experience error events in a unique way and are affected by a wide sphere of long-lasting emotions. After an initial shock, they experience, e.g., fear, guilt, anger, embarrassment, humiliation, and depressive symptoms. Emotion-focused and problem-centered coping (e.g., dealing emotionally with the event or learning from the event) are significantly influenced by insufficient control, characteristic for medicine. Disclosing an event toward patients rarely occurs.

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TABLE 2. *(Continued)*

Author/ Year	Design/Setting/ Country	Sample	Event	Aim/Research Question	Data Collection	Data Analysis	Results
Crigger et al., 2007[35]	*Design:* Grounded theory *Setting:* Public hospital *Country:* United States	*Theoretical sample:* 10 nurses between 25 and 57 y with practical experience between 1 year and 35 y and various ethnic, religious and educational background (Bachelor of Nursing: n = 8; Associate Degree: n = 2; women: n = 9; men: n = 1)	*Error events* defined as measures having actually or potentially entailed harm	The aims were to investigate the psychosocial process starting with the realization of an error event and to examine how participants manage to reconcile their self-esteem and professional image (self-reconciliation).	Semi-structured individual interviews (n = 10)	Open, selective, and axial coding of transcripts	Indications that after error events, nurses pass a process of 4 consecutive and/or discursive steps leading to self-reconciliation with regard to self-esteem, personality, and professional image. The 4 steps comprise *realization of having committed an error* (reality hitting), *evaluating the need to disclose the event* (weighing in), deciding the best way of responding (acting), and evaluating the event and subsequently "moving on" (repair).
Engel et al., 2006[36]	*Design:* Explorative-descriptive qualitative design *Setting:* University hospital *Country:* United States	*Stratified random sample:* 26 assistant physicians between 25 and 39 y with various educational backgrounds (medicine: n = 17; surgery n = 5; gynecology and obstetrics: n = 4; women: n = 12; men: n = 14)	*Error* is defined as "the failure of a planned action to be completed as intended or the use of a wrong plan to achieve this aim." *"Near miss"* is defined as "an event or situation that could have resulted in an accident, injury, or illness, but did not, either by chance or through timely intervention"	The aim was to investigate the emotional challenges associated with medical error events and the ways of coping with this difficult events	Semi-structured individual interviews (n = 26)	Iterative analysis	Indication that after adverse events, assistant physicians have to deal with distress and intensive emotional responses, e.g., guilt, self-doubt, frustration, anger, confusion, fear, isolation, depending on the degree of negative effects associated with the event. While coping requires relief and learning possibilities, conversations about error events with other healthcare professionals and superiors proved to be of central significance.
Kroll et al., 2008[37]	*Design:* Explorative-descriptive qualitative design *Setting:* Hospitals (n = 10) *Country:* England	*Stratified random sample:* 38 assistant physicians with experience in their role between 6 and 12 mo	*Error events* not defined (e.g., diagnosis or treatment error)	The aim was to investigate the experiences, perceptions and meaning of error events and to examine reasons for and against disclosure	Semi-structured individual interviews (n = 38)	Open, axial, and selective coding according to a modified grounded theory approach (no reference indicated)	Indications that assistant physicians to some extent informally discuss error events in supportive teams with peers. Disclosing an error event toward patients is, however, rare. In dealing with error events, many assistant physicians received support and attributed a central, favorite role to colleagues with regard to prevention and minimization of harm. While formal conversations and constructive-supportive feedbacks can probably enhance learning, accusations and reassurance proved obstructive if they were preferred to learning.

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Luu et al., 2012[38]	*Design:* Grounded theory *Setting:* University hospitals (n = 3) *Country:* Canada	*Theoretical sample:* Stage I: 20 experienced (n = 12) and inexperienced (n = 8) surgeons (general surgery: n = 13; neurosurgery: n = 3; cardiosurgery/urology, gynecology/obstetrics/ vascular surgery: each n = 1; women: n = 5; men: n = 15) Stage II: Six general surgeons, allowing to be interviewed within 24 h after an adverse event	*Adverse events* defined as events entailing harm caused by medical treatment and not by the course of the disease.	The aims were to investigate responses and psychological consequences of adverse events and to assess them with regard to judgment and decision-making.	Semi-structured individual interviews (stage I: n = 20) (stage II: n = 6)	Inductive qualitative data analysis with subsequent deductive-qualitative analysis of the reference model (Scott et al., 2009[2])	Indications that surgeons have the impression to be "the only one" experiencing fear, stress, and self-doubts, with possible sex differences. The authors elaborated a 4-stage response conforming to the model of Scott et al. (2009),[2] ranging from feelings of failure accompanied by physiological stress response, loss of control, and concurrent need for recovery and restoration, involving long-term effects (meaningfulness versus change of occupation, consequences concerning judgment and decision-making).
Mankaka et al., 2014[39]	*Design:* Phenomenology *Setting:* University hospital with patients after adverse events in regional hospitals (n = 6) and university hospitals (n = 2) *Country:* Switzerland	*Targeted sample:* 8 assistant physicians (general internal medicine) between 28 and 33 y between second and sixth year of assistance, being responsible for typical adverse events.	*Error events* not defined (e.g., missed diagnosis, inadequate monitoring)	The aim was to answer the question: How do assistant physicians experience medical error events and which kinds if coping strategies do they use?	Semi-structured individual interviews (n = 8)	Inductive-thematic analysis with deductive approaches	Indications that after error events caused by, e.g., tiredness or overwork, assistant physicians can be affected by strong emotional distress in the context of insufficient safety cultures. However, they can also receive various forms of support from superiors. The most important coping strategy proved to be talking about error events. Defensive and constructive changes are possible as a result of error events. Male physicians seem to be less sensitive and more self-confident than female physicians.
May et al., 2012[40]	*Design:* Explorative-descriptive qualitative design *Setting:* Academic institutions and medical practices *Country:* United States	*Casual sample:* 61 physicians (women: n = 28; men: n = 33), average: 46 y, from various subspecialties, being ready to talk about an adverse event (most frequently misdiagnosis) disclosed to patients and families in 61% of cases. Included are data of 46 physicians reaching "wisdom" after being involved in an error event.	*Serious error events* defined as events having resulted in disability, extended length of stay, or deaths	The aim was to investigate the significance of talking to patients, colleagues. and families after serious error events.	Semi-structured in-depth individual interviews (n = 61)	Coding according to the interview guideline with subsequent modified taxonomic analysis (Spadley, 1979)	Indications that not talking about serious error events has an isolating effect on physicians, prevents from reflecting the event, thereby impeding the possibility of learning. While serious conversations are of central importance with regard to recovery and attribution of meaning, dishonest, inhuman, accusatory, insensitive, or egotistical ways of talking about the event proved obstructive. This is also the case for "well-intended" minimalization of the error on the part of colleagues and family members. Fearing legal consequences of conversations represents a major barrier to talking openly about the error event.

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TABLE 2. *(Continued)*

Author/ Year	Design/Setting/ Country	Sample	Event	Aim/Research Question	Data Collection	Data Analysis	Results
Mohsenpour et al., 2016[41]	*Design:* Phenomenology *Setting:* Public and private hospitals (n = 4) *Country:* Iran	*Targeted sample:* 8 nurses (Bachelor degree: n = 6; Master degree: n = 2; women: n = 6, men: n = 2) between 30 and 50 y old with professional experience between 1 y and 24 y	*Error events* not defined	The aim was to answer the question: What does it mean to be perceived as a culprit due to involvement in an error event?	Semi-structured individual interviews (n = 8)	Thematic analysis (van Manen, 2001)	Indications that after error events, nurses are confronted with unpleasant physical symptoms (e.g., heat sensitivity), negative emotions (e.g., fear), and remorse. In addition, they are affected by detailed traumatic memories. Changes resulting from error events can affect the assumption of responsibility, learning from error events, strengthening supportive relationships and spirituality.
Pinto et al., 2013[42]	*Design:* Phenomenology *Setting:* University hospitals (n = 2) *Country:* England	*Targeted sample:* 27 specialist physician (general/vascular surgery; women n = 5; men: n = 22) with professional experience in the current position of minimal 3 y	*Surgical complications* defined as deviation of postsurgical standard	The aims were to investigate personal and professional consequences of surgical complications and to examine factors influencing the response as well as coping with consequences and use of support.	Semi-structured individual interviews (n = 27)	Interpretative phenomenological analysis (Smith et al., 2003)	Indications that because of complications, surgeons in the long term are affected by personal and professional consequences (emotional, behavioral, cognitive, social, and otherwise), according to the possibility of avoiding these complications. Influencing factors consist of the particularities of the individual case, the surgeon's own personality, as well as characteristics of patients and families (e.g., outcomes and reactions), teams and organizations (e.g., blame culture). Discussions about complications, reconstruction of the event and rationalization, aiming at problem- and emotion-focused coping proved to be the most important and most frequently available resource, in addition to collegial support. In contrast, organizational support was described as insufficient.

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Plews-Ogan et al., 2013[43]	*Design:* Grounded theory *Setting:* Academic institutions and medical practices *Country:* United States	*Casual sample:* 61 physicians (women: n = 28; men: n = 33) with a median age of 46 y, various specializations, willing to talk about a serious error event (mostly diagnostic error). Disclosure to patients occurred in 61% of cases. Data are considered of 46 physicians who reached "wisdom" after error involvement.	*Serious error events* defined as events having actually or potentially entailed harm (including disability, death, or additional medical care)	The aim was to investigate the experience of positive coping associated with serious error events	Semi-structured individual interviews (n = 61)	Data analysis according to grounded theory (coding and constant comparative analysis)	Indications that as a result of serious adverse events, physicians can attain growth and "wisdom" via a circular process. After accepting the reality, learning from the event becomes possible as the basis for integrating experiences and reaching advanced ways of perceiving, thinking, and acting. In this context, "wisdom" can be interpreted as a result of reflected experience. A central aspect of this experience is the development of a balance between humility regarding imperfection and self-confidence as a result of positive changes
Rassin et al., 2005[44]	*Design:* Explorative-descriptive qualitative design *Setting:* Major national hospital *Country:* Israel	*Casual sample:* 21 nurses (Bachelor degree: 60%; women: n = 14; men: n = 7), between 21 and 52 y of professional experience, having been involved in a medication error. The event occurred between 3 and 24 mo before the interview	*Medication error* defined as, e.g., dosage errors or administration error	The aim was to investigate the consequences of medication errors on the psychological and social condition. The focus was on subjective perception of the error event and coping with consequences.	Semi-structured in-depth individual interviews (n = 21)	Content analysis (Berg, 1998)	Indications that stress, pressure, and negligence represent central error-promoting factors in the process of medication. Nurses respond to some extent in a long-term physical and emotional way (e.g., with fear and guilt). Initially, they try to cope with consequences and with their responsibility in a rather problem-focused way. Afterward, they pass over to a rather emotion-focused manner of coping, e.g., by talking with their family about error events and by learning from this event.

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TABLE 2. *(Continued)*

Author/ Year	Design/Setting/ Country	Sample	Event	Aim/Research Question	Data Collection	Data Analysis	Results
Rinaldi et al. 2016[45]	*Design:* Explorative-descriptive qualitative design *Setting:* Local health care service and university hospital *Country:* Italy	*Targeted sample:* 33 healthcare professionals (nurses: n = 20; physicians: n = 6; midwifes: n = 4; others: n = 3; women: n = 20; men: n = 13) with professional experience between 3 and 20 y, being able to describe minimally 1 (most serious) event, having occurred between 5 and 132 mo before the interview	*Adverse events* not defined	The aim was to investigate psychosocial consequences of adverse events, focusing on recovery and current support.	Semi-structured individual interviews (n = 33)	Analysis by means of Qualitative Data Analysis Guides of Leuven (Dierkx de Casterleé et al., 2012)	Indications that after adverse events, healthcare professionals can be affected by headache and stomach pain, in addition to the physical and psychosocial symptoms often described in the literature, e.g., extreme tiredness, increased respiratory rate, intrusions, fear of returning to the work place. In this study, participants passed through the 6 stages toward restoring integrity described by Scott et al. (2009)[2] in an American comparative population. Participants expressed their wish for external psychological support and experienced support they received as insufficient. Therefore, less than half of the participants made use of psychological support. The need to talk about the event and to receive understanding was particularly pronounced.
Santos et al., 2007[46]	*Design:* Explorative-descriptive qualitative design *Setting:* Hospital *Country:* Brazil	*Targeted sample:* 15 nurses (predominantly female nursing assistants) between 22 and 49 y, having been involved in an medication error	*Medication error* not defined	The aim was to identify feelings and coping strategies	Semi-structured individual interviews (n = 15)	Thematic analysis (Polit et al., 2004)	Indications that after medication errors, nurses can be affected by panic, despair, concern, guilt, shame, and uncertainty. To reach a feeling of calmness, they search for help in conversations and learn from error events, thereby developing strategies to avoid error events in the future.

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Schelbred et al., 2007[47]	*Design:* Explorative-descriptive qualitative design *Setting:* Hospitals, community services, nursing homes (n = 7 bzw. n = 2 bzw. n = 1) *Country:* Norway	*Targeted sample:* 10 nurses with professional experience between 6 mo and almost 30 y, involved in medication errors having actually or potentially resulted in significant patient harm	*Medication error* defined as events having actually or potentially entailed significant injuries (e.g., dosage error or application error)	The aim was to describe the experiences of nurses involved in serious medication errors to investigate which kind of support they received after disclosing the error event.	Semi-structured in-depth individual interviews (n = 10)	Phenomenological interpretation and analysis (Giorgi, 1985 and 1997)	Indications that after medication errors, nurses are personally and professionally deeply affected, depending, in part, on others' responses. Immediately after a medication error, they respond with panic. However, despite paralysis, exhaustion and loss of control, they try everything to alleviate the harm experienced by the affected patient. Particularly after events entailing irreversible harm, nurses report about personal and professional traumatization, accompanied by guilt, shame, betrayal, suicidal thoughts, or the intention to leave the profession. Most nurses articulate the need for support and attest a better healing effect on conversations with colleagues than with friends or family members. However, they mostly do not receive sufficient support. Overall, nurses are willing to share their experience. This, however, implies the possibility to feel trust.
Schwappach et al., 2010[48]	*Design:* Explorative-descriptive qualitative design *Setting:* Hospitals *Country:* Switzerland	*Targeted sample:* 11 nurses, 7 physicians	*Error event* not defined	The aims were to investigate the needs for supportive interventions and to identify factors allowing and fostering positive coping and overcoming error-related stress.	Focus group interviews (n = 3)	Qualitative analysis	Indications that nurses and physicians in Swiss hospitals are affected by emotional responses similar to those described in international literature (e.g., vegetative reactions, guilt, shame). To receive support, they search for a person of trust and articulate the need for a committee offering support on the emotional level, supplementary to the CIRS committee. They also express the necessity of education and further education as well as for support programs with the aim of learning to cope with error events. According to the results, nurses show different ways of dealing with error events.

(Continued next page)

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TABLE 2. *(Continued)*

Author/ Year	Design/Setting/ Country	Sample	Event	Aim/Research Question	Data Collection	Data Analysis	Results
Scott et al., 2009[2]	*Design:* Explorative-descriptive qualitative design *Setting:* University hospital *Country:* United States	*Targeted sample:* 31 health care professionals with professional experience between 6 mo and 36 y (physicians: n = 10; nurses: n = 11; others: n = 10; women: n = 18; men: n = 13); the event took place between 3 mo and 44 mo before the interview	*Adverse event* not defined	The aim was to describe and characterize the experiences and the course of restoration	Semi-structured individual interviews (n = 31)	Iterative reading, classification of stages and characterization	Indication that confrontation with an adverse patient event can be a life-altering experience for healthcare professionals, independent of sex, profession and professional experience, releasing psychosocial (frustration) and physical symptoms (extreme tiredness) as well as trigger-related flashbacks. Emotions can be classified by means of a 6-step course leading toward restoration, comprising chaos, response, intrusions, restoration of personal integrity, enduring the investigation, receiving emotional first aid, and "moving on" in 3 ways: leaving the profession, surviving, or thriving in professional life.
Ullström et al., 2014[49]	*Design:* Explorative-descriptive qualitative design *Setting:* University hospital *Country:* Sweden	*Targeted sample:* 21 health care professionals with professional experience between 5 and 30 y (physicians: n = 10; nurses: n = 9; others: n = 2; women: n = 16; men: n = 5)	*Serious adverse events* defined as events having actually caused harm or having a high risk to cause harm (e.g., medication error or diagnostic error)	The aim was to investigate how healthcare professionals are affected by avoidable serious adverse events; the focus was on desired and received organizational support.	Semi-structured individual interviews (n = 21)	Qualitative content analysis (Shanon et al., 2005; Graneheim et al., 2004)	Indications that adverse events can have a personal effect (emotional distress) as well as a professional long-term effect on health care professionals, depending on the response of the organization. Many professionals react emotionally, e.g., with shock, sadness, or fear, and feel uncertain about their professional role. Although they express the need to talk about the event and to receive emotional support from the organization and from peers, organizational support is insufficient, unstructured, and unsystematic. Lack of support and feedback complicates emotional processing.

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van Gerven et al., 2016[50]	*Design:* Explorative-descriptive qualitative design *Setting:* Hospitals *Country:* Belgium	*Casual sample:* 31 health care professionals (nurses: n = 17; physicians; n = 11; midwives: n = 3), having been directly involved in patient safety events resulting in deaths (n = 14), serious harm (n = 9), short-term harm (n = 7) or no harm (n = 1). Excluded were health care professionals having been involved in legal cases or having been involved only indirectly in patient safety events	*Patient safety events* defined as events or circumstances causing or having caused harm	The aims were to identify the consequences of patient safety events with regard to coping strategies, support needs, and received support and to identify factors influencing the extent of second-victim experience.	Semi-structured in-depth individual interviews (n = 31)	Using sensitive concepts (Bower, 2006)	Indications that after serious patient safety events, healthcare professionals are personally and professionally affected by symptoms presenting on an emotional, psychological, and physical level. They use several problem- and emotion-focused coping strategies. One of the aims consists of learning from the event. Therefore, second victims should be, e.g., integrated into RCA. However, repression and flight are also common ways of coping. To openly discuss patient safety events, safety culture is required as a supportive basis, formed by colleagues, families, and professionals. The extent of the consequences on second victims depends on various personal, situational, and organizational aspects

Author's own chart.

CIRS, critical incidence reporting system.

analyses (RCA).[36,38,40,42,43,48,49] As *understanding* and *acting* require readiness to learn, training and further education are vital not only to preventing adverse events but also to responding to their occurance.[34,40,45,48–50]

Healthcare professionals respond similarly to different events, based on their seriousness.[2,34,36,37,41,42,49,50] In the conflict between expectation and reality, personally experienced responsibility is of major importance for many second victims.[33,35–38,42,44,46,49] Reactions can also depend on personal traits, e.g., self-efficacy, resilience, perfectionism or professional experience, spirituality, and sex aspects.[2,34,38,39,41–43,48–50] For example, as a result of a perfectionism, *healthcare professionals* may be more affected by feelings of guilt when they interpret errors as individual failures and seek zero tolerance for errors.

Appraising the Situation

Experiencing Stress and Trauma

After initial incomprehension, second victims *realize* their responsibility for avoidable *events*.[2,35,41,45,47,49] In our model, only events associated with significant *stress* have further relevance. Nonstressful events can inspire either a sense of *well-being* (good luck) or *learning*.[36,37,42,48]

After initial nonspecific stress experience (e.g., shock), second victims *respond* rather *physiologically* or rather *psychosocially.*[33–35,41,47–50] *Physically*, common symptoms range from *sleep disturbance* to muscular tension.[2,34,35,39,42,44,45,47–50] *Psychosocial* responses are characterized by a sense of damaged personal integrity[33,34,36,38,39,41,44,46–48,50]:

"Nurses expressed feelings of guilt because they felt that they had oppressed or betrayed someone who had needed them and had trusted them with his or her life."[41(p5)]

Having participated in a serious adverse event, second victims' experience severely conflicting emotions: having caused suffering, some feel they should suffer[33–42,44,46–50]; having suffered trauma, many experience *anxiety and panic, with potential health consequences*.[2,34–36,38,41,44–47,49,52] A broad variety of a*nxieties* of second victims are related both to the harm of first victims and to their own situation as second victims, e.g., anxiety to loss of trust and legal consequences.[2,34,35,41,42,44–47,49,50] In addition, feelings of inadequacy, uncertainty, and reduced *self-confidence* often arise.[2,33–36,38,39,41,45–50] Other consequences can include flashbacks, burnout syndrome, *depression*, and suicidal thoughts.[2,34,38,41,42,45–47,49,50] On a personal level, *psychosocial responses* swing between anger-frustration and regret-repentance; on a *professional* level, reduced *performance* can manifest as efficiency deficits or defensive decision-making.[2,33–39,41,42,45,47,49,50]

Unlike normal stressful events, second-victim experiences include incisive *trauma*, with effects extending beyond initial stress responses and leaving a profound impression at both private and professional levels.[2,33–36,38,41,42,44–50]

Restoring Integrity

Understanding and Acting

Second victims need an internally and externally motivated (e.g., by superiors) *restoration of integrity.*[2,33,34,38,43,47,50] The *emotion- and event-oriented process of acting* on traumatic experience can be rather *constructive* or rather *destructive*. Focusing on *understanding and acting,* its aim is to achieve a return to work as soon as possible, with regained self-esteem.[2,35–38,40,42,43,47,49,50]

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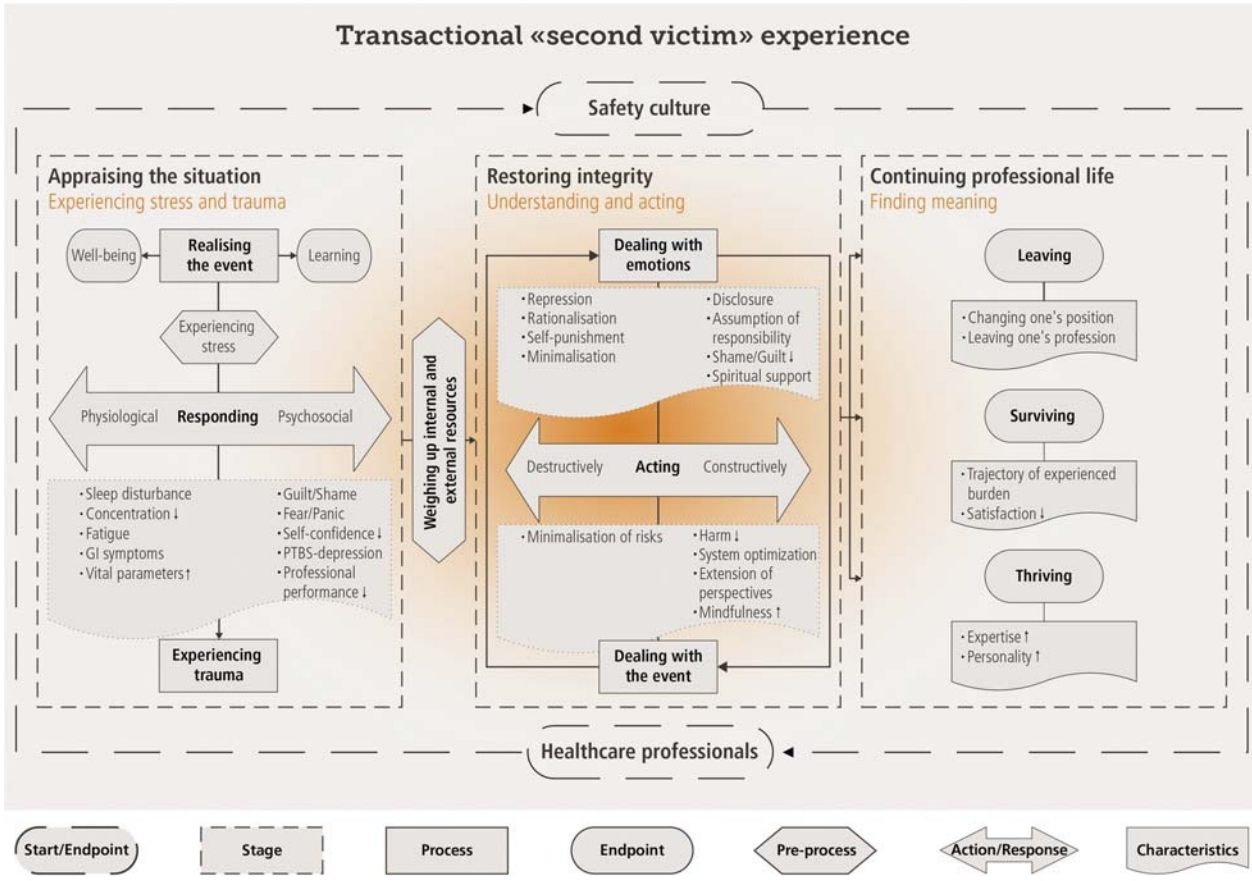

FIGURE 3. Transactional second-victim experience (author's own chart). Icon legend is based on the International Organization for Standardization (1985).[51]

A discursive process combining reconciliation/forgiveness with coping with imperfection has proved key to *returning to professional life*.[34,35,37,38,43,47]

Repressive mechanisms, e.g., *rationalization*, *self-punishment, minimalization,* are *destructive emotion-oriented responses to adverse events;* more *constructive emotion-oriented strategies, e.g., disclosing* the event to the first victim often receive high priority but can have complex outcomes[33–38,40–44,46–50]:

"Although they were comforted when the family forgave them or grieved alongside them, surgeons also recognized difficulty with these interactions."[38(p1184)]

Many second victims wish to apologize to their corresponding first victims but received lawyers' recommendations to maintain silence.[35,40,43,44] For some, *disclosing* the event results from a process of consideration.[34,35,37–39,41,43,46,47,49] Depending on the level of harm and "real" error, second victims may disclose varying degrees of detail.[34,35,37,38,41,43,46,47,49] In this respect, along with events that cause harm with potential legal consequences, well-known events are favorable for *disclosure*; unknown error events, as well as anxiety and minor length of service on the part of the second victim, are unfavorable.[35,37]

Although *minimalization* is a rather *destructive task-oriented way of dealing with an event*, *constructive task-oriented strategies,* e.g., learning, rank among the most helpful.[2,33–39,41–45,47,49,50] In the short term, second victims strive to reduce *harm* in first victims and to restore medical stability[34,36,41,44]; in the medium term, they wish to participate in RCA to prevent recurrences of their experiences and *to optimize the system*, e.g., via error prevention programs[2,34–36,38–40,42,43,45,48–50]; and in the long term, it is necessary to extend *perspectives* toward fallibility.[35,41,43] Expressions of this include improvement-oriented behavior patterns, *increased mindfulness* with regard to imperfectness, and self-care, as well as increased patient centricity.[2,34,38,42–45,47,50]

Continuing Professional Work

Finding Meaning

Traumatic second-victim experience also has a long-term existential effect on *professional life*.[47] *Re-evaluation* and *perceived meaning* can both support private and professional improvement of the situation.[43]

Whereas second victims with serious professional doubts may *change their positions* or *leave their profession*, some second victims continue their profession lives with unimpaired performance despite a *trajectory of burden* and *reduced work satisfaction (surviving)*.[2,33,37,38,45,47,49,50]

Most desirably, *thriving* can follow a positive turn of a traumatic experience, characterized by *enhanced expertise* and an *evolved personality*.[2,34,38,43,45,46] Both can manifest in improved handling of complexity and uncertainty, as well as in a revised view of oneself and the world. *Second victims* who have regained their self-confidence see themselves as imperfect, but good *healthcare professionals*[34,38,43,45,46]:

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TABLE 3. Metasummary

	Transactional Second-Victim Experience						
	Category					Intensity (%)	
Author/Year	Safety Culture*	Healthcare Professional	Appraising the Situation	Restoring Integrity*	Continuing Professional Life	Dichotomous	Continually/n = 2015
Balogun et al., 2015[33]	33	10	10	21	1	100	4
Christensen et al., 1992[34]	34	24	48	32	7	100	7
Crigger et al., 2007[35]	11	10	33	67	1	100	6
Engel et al., 2006[36]	39	4	29	17		80	4
Kroll et al., 2008[37]	32	14	11	15	1	100	4
Luu et al., 2012[38]	22	9	24	19	5	100	4
Mankaka et al., 2014[39]	17	12	15	13		80	3
May et al., 2012[40]	87		8	10		60	5
Mohsenpour et al., 2016[41]	23	10	90	18		80	7
Pinto et al., 2013[42]	45	25	29	26	1	100	6
Plews-Ogan et al., 2013[43]	11	5	3	57	16	100	5
Rassin et al., 2005[44]	8	5	16	16		80	2
Rinaldi et al., 2016[45]	30		64	15	9	80	6
Santos et al., 2007[46]	4	1	18	8	1	100	2
Schelbred et al., 2007[47]	47		44	39	7	80	7
Schwappach et al., 2010[48]	76	3	11	9		80	5
Scott et al., 2009[2]	25	4	50	20	14	100	6
Ullström et al., 2014[49]	34	7	39	21	2	100	5
van Gerven et al., 2016[50]	114	17	73	57	3	100	13
Frequency (%)							
Dichotomous	100	84	100	100	68		
Continually	34	8	31	4	3		

*Intersecting categories.

Author's own chart.

"[in] < the humble expert > … physicians described learning to temper their expertise with humility and learning to have confidence without being cocky."[43(p240)]

Metasummary

As Table 3 shows, all included studies contributed to one or more of three categories: *safety culture*, *appraising the situation,* and *restoring integrity;* 58% contributed to all categories.[2,33–35,37,38,42,43,46,49,50] The median contribution of each study was 5%; the most recent and the oldest were most influential.[34,50]

DISCUSSION

This qualitative metasynthesis highlighted, described, and interpreted second-victim experiences in acute-somatic settings. Based on 19 qualitative studies, the main outcome is a model of transactional second-victim experience. Including the central stages of appraising the situation, restoring integrity, and continuing professional life, this experience is moderated by safety culture and healthcare professionals. The model finds its theoretical foundation in Lazarus' model of stress,[19] as well as in Antonovsky's "sense of coherence."[20] Against the background of a primarily physiological experience,[3] we assumed that supporting a person to restore their integrity could prevent long-term pathological consequences. There is some evidence, which support from peers and superiors can have a protective influence on burnout.[53] A prospective longitudinal study showed that, in the context of serious adverse events, assistant physicians have significantly increased burnout scores and a threefold elevated risk of depression.[54]

Scott et al (2015)[55] reaffirmed that safety culture can be both a key factor of support and a measurable end point. In addition to the wish of second victims for cultural change and learning needs, the authors emphasized the importance of communication with first victims, support by peers and superiors, and external emotional support as factors of a positive safety culture. These factors are congruent with safety culture features described elsewhere.[56]

An organization's treatment of second victims reflects its safety culture and represents an important aspect of socialization. Ideally, adverse events offer team learning opportunities. Regarding organizational support and underscoring the importance of results from Burlison et al. (2016),[57] alongside absenteeism, their results associate intention to abandon one's workplace significantly with the support of peers and superiors. Peer support is the strongest predictor of second victims' recovery,[57]and Edrees et al. (2016)[58] observed that recovery can be improved and promoted via institutionalized telephone support from colleagues. However, the current results support the literature's indications that collegial readiness to support second victims can be limited[59]: barriers to support programs' use include missing knowledge about their availability and doubts regarding their reliability.[58,60,61]

After the initial stress response, the second victim's appraisal of the situation is influenced by feelings of guilt and reduced professional performance. In systematic reviews, guilt was those most frequently reported emotional response.[12,14,16] The current results

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concerning second victims' efficiency deficits and tendencies toward defensive decision-making confirm the thesis regarding reciprocity of error involvement, posttraumatic stress response, and endangered patient safety due to reduced professional performance.[3]

Disclosing the event relates significantly to reducing guilt feelings and can contribute to restoring ones sense of integrity; however, disclosure only occurred in a third of cases.[62] The present metasynthesis described disclosure as a process of consideration, which is also expressed in a just recently published "qualitative systematic review" ($n_{Studies} = 9$) using the Joanna Briggs Institute meta-aggregation approach about second-victim experiences of predominantly female nurses, which describes disclosing as a dilemma.[63] Reasons for forgoing disclosure include fear of legal consequences, deficient communication skills, and inadequate support.[62] Interprofessional skill training could overcome missing communication skills; this would benefit the second victim by increasing the chances of the first victim directly forgiving them.[62,64,65] According to the outlined potential of disclosing adverse events on the recovery of second victims, it is necessary to establish guidelines and structures that promote, instead of often selective, full disclosure; this as a strategy not only to reduce liability damages but also to meet ethical obligations to first and second victims.[66–69]

This metasummary on the one hand offers comprehensive state of knowledge regarding safety culture, situational appraisal, and restoring integrity. On the other hand, it illuminates knowledge gaps concerning destructive forms of dealing with the event. This knowledge gap may result from an underlying selection bias of included studies. It is possible that only second victims with predominantly constructive strategies for dealing with adverse events are recruited for studies, because others are unavailable because of changing their profession. However, especially during a deepening skills shortage, further knowledge should be obtained by identifying the perspectives of colleagues who support second victims.[70] Not disclosing an event proved to be the most frequent defensive coping strategy in the review by Seys et al. (2013).[14]

Limitations

To the authors' knowledge, the current model offers the first conceptual framework to understand second-victim experience across professions and cultures. Despite efforts to ensure reliability, the results should be seen in the context of two major limitations. For the most part, only one person evaluated the methodological quality of included studies and coded the data of only German and English articles in German. In addition, being three times removed from direct experience may have diminished the results' credibility during interpretation.

CONCLUSIONS

The newly developed model works for the first time systematically from the second-victim perspective based on qualitative studies including majoritarian physicians and nurses. This perspective should increasingly be applied to daily practice to promote institutional safety culture. As a platform upon which to refine policies fostering professional development and preservation, the new model contributes ultimately to patient safety.

Implications for Practice

Many organizations are unprepared for serious adverse events.[71] The need for hospitals to conceive second-victim experience as a clinical emergency and to prepare accordingly is emphasized.[48]

Our results indicate that hospital safety culture affects not only patients but also healthcare professionals. Therefore, safety culture can provide a path to support second victims in restoring their integrity. These results indicate a scope for integrating second victims in RCA, in the elaboration and implementation of recommendations for event disclosure to first victims, in ensuring a trustful approach to superiors, in learning from a systemic viewpoint, and in communicating existing support programs. Although the effectiveness of RCA in learning from errors and preventing recurrences can be questioned, RCA has the potential to relief burdens of affected healthcare professionals at the sharp end due to insights in the systematic emergence of adverse events.[72,73]

Implications for Education

Stakeholders in education should meet second victims' request for a culture prepared for adverse events. One central prerequisite would be curricular integration of the second-victim experience on all levels of healthcare professional education. In this regard, definitions and descriptions of factors triggering second-victim phenomena, consequences, theoretical frameworks, support systems, and barriers to support are all relevant.[74] The second-victim transactional model can support curriculum development, transmit a valid knowledge base, and contribute to socialization in dealing with human fallibility.

Implications for Research

According to the current knowledge concerning safety culture, appraisal of adverse event situations, and restoration of integrity, further research should focus on developing and implementing effective supportive interventions. Therefore, the model of transactional second-victim experience provides a valid knowledge base and promotes the integration of the affected persons' perspectives. Investigating the effectiveness of supportive interventions and examining the problem vis-à-vis payers will require development and evaluation of culture-specific instruments to assess second-victim experience including support. For practical use, an instrument such as that by Burlison's et al. (2017)[75] could facilitate discussions and supportive approaches. To ensure targeted support in the early, it should differentiate between second-victim experience and burnout or depression. The newly developed transactional model of second-victim experience will contribute to this.

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