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# The “Double Victim Phenomenon”—Results From a National Pilot Survey on Second Victims in German Family Caregivers (SeViD-VI Study)

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**Introduction:** Second-victim phenomena may lead to severe reactions like depression or posttraumatic disorder, as well as dysfunction and absenteeism. Medical error as a cause for second victims is not limited to professionals, as family caregivers care for millions of patients at home. It remains unclear whether these are first, second, or double victims in case of error. This explorative study investigated whether second victim effects and signs of moral injury are detectable in family caregivers and whether existing instruments are applicable in lay persons.

**Methods:** In an open convenience sampling online survey, we recruited 66 German family caregivers. Propensity score matching was conducted to obtain a balanced sample of family caregivers and qualified nurses who took part in the previous study by adjusting for age and sex. The groups were compared regarding the German Version of the Second Victim Experience and Support Tool-Revised and the German version of the Moral Injury Symptom and Support Scale for Health Professionals.

**Results:** Sixty-six caregivers participated, of whom 31 completed the survey. Of all, 58% experienced a second victim-like effect, 35% experienced a prolonged effect, and 45% reported to still suffer from it. In a matched sample (22 family caregivers and 22 nurses), no significant differences were observed between the groups.

**Discussion:** Regarding the limitations of this pilot study, demanding for resampling in larger populations, we could show that second victim effects and moral injury are detectable in family caregivers by validated instru-

ments and are not inferior to professionals' experiences. Concerning the demand for further studies, we confirmed the applicability of the testing instruments but with need for item reduction to lower response burden.

**Key Words:** second victim, traumatization, psychological aid, psychosocial support, family medicine, family caregivers, out-of-hospital intensive care, neurorehabilitation, proxy

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## Background and Rationale

The second victim phenomenon (SVP)<sup>1,2</sup> and caregivers' psychological resilience have become subjects of heightened interest in science, medicine,<sup>3,4</sup> and politics.<sup>5</sup> SVP refers to healthcare workers who experience negative effects after being involved in an adverse event while caring for their patients.<sup>2</sup> In Germany and Austria, SVP has been identified in various healthcare professionals, including internal medicine residents,<sup>6</sup> nurses,<sup>7</sup> emergency physicians,<sup>8</sup> pediatricians,<sup>9</sup> and general practitioners.<sup>10</sup> Recent studies have shown varying lifetime prevalence rates of SVP among healthcare professionals, ranging from approximately 40% in an Austrian hospital<sup>11</sup> to over 60% in Germany and up to 89% among Austrian pediatricians.<sup>6–9</sup> While most SVPs resolve,<sup>12</sup> a significant proportion of healthcare providers may leave the health system, including workplaces directly involved in patient care, as a consequence of exposure to such experiences. Moreover, possible consequences of SVP may extend to healthcare professionals working in a dysfunctional state, contributing to further medical errors, defensive medicine, and retraumatization.<sup>12–15</sup> In severe cases, SVP may lead to posttraumatic stress disorder, depression, and even suicide,<sup>6,16,17</sup> imposing a substantial burden on medical facilities, healthcare systems, and society.

However, the current definition of SVP only includes professional healthcare providers,<sup>2</sup> overlooking a possibly similar impact on family members in their dual roles as caregivers and familial figures (spouse, parent, sibling, or friend). Another significant phenomenon in this context is moral injury, defined as a profound violation of one's morality and belief, initially described in military veterans and later associated with SVP in healthcare.<sup>18–20</sup> Likewise, the phenomenon of moral injury within the context of informal family caregiving has not been previously described.

In 2021, about 4.1 million citizens required home care in Germany, with 2.1 million solely cared for by family members. About 793,000 were registered in long-term facilities.<sup>21</sup> For the past two decades, caregiver health has garnered attention,<sup>22</sup> given their crucial role in health systems facing resource and medical staff constraints.<sup>23,24</sup> These predominantly lay “family caregivers,” primarily unpaid and predominantly women, are vulnerable to developing depression, anxiety disorders,<sup>25</sup> stress, and frustration.<sup>26</sup> Family caregivers are also at risk of drug and alcohol dependency, heart disease, cancer, and diabetes.<sup>27</sup> Furthermore, in some cases,

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family caregivers may even exhibit abusive behavior toward family members entrusted to them.<sup>28–30</sup>

Furthermore, medical error in home care might include errors in:

- airway management (e.g., dealing with a tracheostomy and dysphagia),
- breathing disorders (e.g., pneumonia, mechanical ventilation<sup>31</sup>),
- cardiovascular aspects (sepsis, arrhythmia, errors in dealing with cardiac devices),
- neurological factors (dementia, contractures, stroke deficits or epilepsies, and the prevention of falls<sup>32</sup>),
- medical products, and
- body exposures (e.g., gastrostomy, catheters, wounds, pressure ulcers),
- pharmacology (e.g., complex medication, formula, dose, and access route<sup>33</sup>),
- gastroenterology (e.g., malnutrition, hyperglycemia and hypoglycemia, weight loss, cachexia, frailty),
- hematology (e.g., bleedings of ENT tumors),
- infection control.

Medical errors in the context of family caregivers are notably distinct and complex. This complexity arises from their multilayered role, where psychological factors such as feelings of responsibility and guilt, as well as perceiving a loved one's illness as punishment, emphasize the delicate balance family caregivers must achieve when advocating for their loved ones and managing their own emotional responses to medical errors.<sup>34</sup> Legal challenges further exacerbate this role; despite having common liability insurance, family caregivers lack legal protection for errors and breaches of confidentiality. Therefore, the legal challenges that family caregivers encounter in this context are particularly demanding, as a medical error by them could not only result in increased social isolation (e.g., "gossip") but also potentially exposes them to legal consequences.

In addition, our extensive literature search on stress in home care revealed no evidence regarding the impact of medical errors on lay caregivers or the characterization of second victim and moral injury effects on them. This gap indicates a lack of specific research on the SVP and moral injury among family caregivers, despite the substantial body of research on the burden family caregivers experience. As we previously noted, by definition, family members cannot be considered second victims because they are not professional healthcare providers. However, hypothesizing they could potentially fall into this category, the burden of a dual victimization they might experience after a medical error or other adverse events involving a family member entrusted to them remains unknown.<sup>35</sup> Thus, in such cases, family caregivers may be considered both first (as a family member of a patient) and second (as a healthcare provider) victims.

## Objectives

This study investigated whether applying second victim assessment instruments to lay caregivers for family members reveals similar reactions to medical adverse events as observed in healthcare providers.<sup>6–8,36</sup> To summarize, we hypothesized that SVP-like events are detectable (hypothesis 1) among family caregivers and lead to measurable reactions comparable to those of professional caregivers (such as nurses) using SVP detection instruments like German Version of the Second Victim Experience and Support Tool Revised (G-SVESTr) and German version of the Moral Injury Symptom and Support Scale (G-MISS-HP, hypothesis 2).<sup>20,37</sup> Our hypothesis 2 did not aim to determine equivalence, but rather to propose that reactions from family caregivers show minor differences compared with those of professionals such as nurses with an effect

size that is not large. The pilot nature of this study also leads to hypothesis 3, suggesting that the questionnaire is feasible for research in larger populations.

## METHODS

### Study Design

We conducted a national convenience sampling online survey developed by a professional group consisting of physicians experienced in prior studies on second victims (RS, SB), one palliative nurse in a leading educative position (SH), and one physician with over 25 years of experience in out-of-hospital intensive care (PD).

The study took place from November 2022 to October 2023. According to the study design, we aimed to detect the phenomenon, not to collect demographic or epidemiological data. Consequently, we used an open access survey design with the possibility for secondary sharing. We addressed potential family caregivers via direct mail to foundations, associations, cooperation, support groups ("MAIK," "Kindernetzwerk," "Intensivkinder Zuhause," DIGAB), social media groups (LinkedIn, Facebook, Xing), and lay journals on home intensive care ("NOT," "Beatmet leben"). Given the open nature of the study, unknown activity of group members or readers, the entire population addressed is not known. The inclusion criterion was self-report of being a family caregiver with a statement on the provision of medical tasks in home conditions for a family member. In addition, to compare family caregivers with professional healthcare providers, we used data from both a current and a prior study. The latter was obtained from a preceding convenience sampling online study on moral injury and second victim among professional caregivers.<sup>20</sup>

### Variables and Measurement

The survey encompassed demographic data (including objective age, subjective age, sex, profession, length of caregiving in years, type of medical support covered, documentation needs, conflicts with family members, professionals, bureaucracy, relation to the persons cared for, grade of care, age of the person cared for, nationality, and religion) and inquiries about prior awareness of the term "second victim." We combined psychometric instruments modified for laypersons incorporating an assessment of subjective experiences in caregiving, the German version of the G-MISS-HP to detect moral injury,<sup>20</sup> the Big Five Inventory (BFI-10) in a short version<sup>38</sup> to assess personality characteristics, especially neuroticism, as risk factors,<sup>7</sup> the 12-item instrument by Bartholomeyczik on Workload in nursing<sup>39</sup> to evaluate workload, the G-SVESTr for identifying second victim reactions<sup>37</sup> and an adaption of the "Second Victim in Deutschland" (SeViD) Questionnaire<sup>36</sup> for comparability with precedent studies (see Table 1 for an overview and Supplement 1, <http://links.lww.com/JPS/A634>, and 2, <http://links.lww.com/JPS/A635>, for the whole survey in German and English). To determine the level of assistance required for individuals to be cared for, we used the federal description of "Pflegegrad" (PG), which defined the intensity of support.<sup>40</sup> PGs are assigned values ranging from 1 (minor assistance needed) to 5 (highest severity of physical, psychological, and cognitive impairments; high-dependency for support).

### Measurement

We measured variables according to the surveys that demonstrated evidence of validity. Ascending 5-point Likert scales were used for the subjective exhaustion scale, BFI-10, ALLBUS, and G-SVESTr, while an ascending 10-point Likert scale was used for eight items belonging to the G-MISS-HP (the overall

**TABLE 1.** Survey Overview

Instrument	Measurement	English Version	German Version
German Version of the Moral Injury Support Scale for Health Care providers (G-MISS-HP)	10 item survey to detect the acute violation of moral beliefs (Moral Injury)	Mantri <sup>18</sup>	Trifunovic <sup>20</sup>
BIG-FIVE Short Inventory in German Version (BFI-10)	10 item survey for the detection of personality characteristics (openness, agreeableness, neuroticism, extraversion, conscientiousness)		Rammstedt <sup>38</sup>
German Workload in nursery	12-item instrument on Workload in nursery		Bartholomeyczik <sup>39</sup>
German Version of the Second Victim Experience and Support Tool Revised	A 34-item scale with 9 dimensions (psychological distress, physical distress, colleague support, supervisor support, institutional support, professional self-efficacy, turnover-intentions, absenteeism, resilience)	Winning <sup>41</sup> based on Burlison <sup>42</sup>	Strametz <sup>37</sup>
SeViD Questionnaire	Extract of the original German Survey on second victims	N/A	Strametz <sup>36</sup>

G-MISS-HP overall score 10–80, a higher score indicates a more severe experience of moral injury). In accordance with a recent study conducted by our research group, we used an overall sum G-SVESTR as a sum score derived from its nine subscales, ranging from 5 to 45 (with higher scores indicating a more severe second victim experience).<sup>10</sup>

**Statistics**

We assessed bivariate correlations between G-SVESTR sum score, G-SVESTR overall score, G-MISS-HP, personality traits, and demographic variables among family caregivers using Pearson’s correlation coefficients. This exploration aimed to validate the measures used in our study. Identifying anticipated correlations enhances the credibility of our measurement tools, reinforcing their effectiveness in assessing the intended constructs. Differences between completers (individuals who completed the entire questionnaire) with noncompleters (those who did not finish it) regarding demographics and individual instruments’ values were tested using *t* test for independent samples.

Hypothesis 1 was explored by analyzing the distribution of responses to the item where family caregivers could identify themselves as second victims after being presented with the definition of SVP.

For the testing of the hypothesis 2, we used data from the G-MISS-HP validation study (which also included the G-SVESTR).<sup>20</sup> The study comprised 46 nurses and intensive care unit nurses. In this study, we compared the G-SVESTR subscales and overall scores, along with the overall G-MISS-HP sum value between two distinct groups: professional caregivers and family caregivers who completed both the G-SVESTR and G-MISS-HP.

We tested the hypothesis 2 by utilizing a quasi-experimental design using propensity score matching method with the goal of achieving greater internal validity compared with that of correlational studies by enhancing control over confounding variables age and sex between family caregivers and controls (nurses). These variables were selected as control variables, as several studies have indicated that age and sex can be correlated with the second victim experience and moral injury.<sup>6,8,19</sup> These variables were gathered in both the current study and the G-MISS-HP validation study.<sup>20</sup> Despite certain personality traits, notably neuroticism, being correlated with the likelihood of second victim experience and symptom load,<sup>8,9</sup> we were unable to control for personality traits as they were not collected in the G-MISS-HP validation study.<sup>20</sup> Therefore, we compared the levels of second victim and moral injury

burden between nurses and family caregivers using propensity score matching with a straight-forward and 1:1 nearest neighbor matching method without replacement. We matched the cases with controls for age and sex with a tolerance of 0.05. Tolerance is a parameter in matching that controls how closely the propensity scores of matched pairs need to be. A tolerance of 0.05 indicates that matched pairs must have propensity scores within 0.05 of each other. This helps ensure a more precise match but may result in fewer matched pairs. After propensity score matching, we compared the propensity scores in the case and control group and inspected the plots of propensity score distributions to ensure balanced distribution of age and sex. Effect sizes were determined using Cohen’s *d* metric for variables with the following interpretation:  $d < 0.5$ ,  $0.5 \leq d < 0.8$ , and  $d \geq 0.8$  indicating small, moderate, and strong effect size, respectively. Cramer’s *V* was used for categorical variables, with  $V < 0.1$ ,  $0.1 \leq V < 0.5$ , and  $V \geq 0.5$  indicating small, moderate, and strong effect sizes, respectively.

Bivariate comparisons between two groups (professional nurses [controls] versus family care givers [cases]) regarding demographics (age and sex), G-SVESTR subscale score, overall G-SVESTR score, and G-MISS-HP score before and after matching were conducted using the independent *t* test for continuous data and the  $\chi^2$  test or Fisher’s exact test for categorical data. To enhance the robustness of the estimates, standard errors, and confidence intervals, we implemented bootstrapping at the 95% confidence intervals for the computed *t* tests and Pearson’s correlations (bias-corrected and accelerated [BCa] method based on 5000 bootstrap samples). We adopted a listwise approach for handling missing data; however, all participants who responded to the specific items essential for the analysis were included, regardless of survey completion status. For categorical data, we describe frequencies and percentages. For interval-scaled data, we use measures including the mean (average), standard deviation (SD), median, and first and third quartiles (Q1, Q3). Reporting both mean and median enhances statistical robustness, especially in skewed distributions. The mean estimates the probability of excess in asymmetrical distributions, while the median signifies the central point. This dual-measure approach offers a more complete understanding of central tendency and variability, supporting a complex presentation of diverse data patterns.<sup>41,42</sup> We conducted descriptive and inferential statistics using IBM SPSS v. 29.0 (Armonk, New York, NY). A *P* value below 0.05 was considered statistically significant.

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## RESULTS

### Participants

Altogether, we recruited 66 family caregivers in Germany, of whom 31 completed the survey. Among these 66 who provided information on demographic data and the caregiving tasks they perform for their family members, as well as their prior education in healthcare, 13 (20%) reported having knowledge about SVP. Age ranged from 32 to 75 years with a mean age of 53.3 (SD 12.3) and a median of 53 (Q1 44.5, Q3 60.5) years. Subjective age spanned from 20 to 75 years with a mean of 49.1 (SD 15.9) and a median of 50 (Q1 40, Q3 60) years. Of the total 66 participants, 54 were female, accounting for 82%. Caregivers reported preceding medical education in 22/66 cases (33%). The length of caregiving was reported to range from 6 months to 46 years (mean 12.8 [SD 10.2], median 11 [Q1 4.9, Q3 16.8]). Professional support for the family caregivers was absent for 37 (56%) caregivers. None of them reported receiving continuous assistance from professionals. They reported assisting patients with personal hygiene (n = 52, 76%), preparing medications (n = 50, 76%), oral drug administration (n = 51, 77%), inhalational drug administration (n = 14, 21%), parenteral drug administration (n = 12, 18%), oxygen support (n = 11, 17%), care for gastrostomy (n = 9, 14%), oral suctioning (n = 5, 8%), endotracheal suctioning (n = 6, 9%), tracheal cannula support (n = 5, 8%), partial invasive ventilation at home (n = 2, 3%), complete invasive ventilation at home (n = 6, 9%), dealing with seizures (n = 11, 17%), caring for chronic wounds (n = 11, 17%), and psychiatric support, e.g., in dementia, tendency to wander off or aggressiveness (n = 32, 49%). In addition, free-text entries reported about caring for hemodialysis or applying urinary bladder catheters. Of all 66 persons, cared for 14 (21%) tended to be in a curative state, 30 (46%) in a palliative-rehabilitative condition, 21 (32%) in a preterminal, and 5 (8%) in a terminal state. Sixty-four of 66 (97%) persons cared for had a “degree of care” according to German national regulations (“Pflegegrad” PG).<sup>40</sup> The patients’ age ranged from 2.5 to 96 years (mean 45.4 [SD 33.0], median 41 [Q1, Q3 15, 80.1]) and had a degree of care level in 5% (PG-1), 15% (PG-2), 117% (PG-3), 23% (PG-4), and 33% (PG-5).

The 66 family caregivers were parents (47%), spouses (17%), children (27%), siblings (3%), or no relatives (3%) to the person cared for. They reported documentation efforts to be neglectable (33%), minor (20%), moderate (23%), high (12%), and very high (8%). In these 66, conflicts with other persons were regularly present involving other family members (76%), friends and relatives (50%), neighbors (12%), ambulant professional caregivers (32%), physicians (44%), insurance companies (51%), administrative authorities (59%), and medical regulatory agencies who externally control cost coverage of treatments (MD, “Medizinischer Dienst”; 44%). Respondents reported these conflicts to be of a permanent condition in 9% (friends), 5% (neighbors), 0% (outpatient care services), 3% (physicians), 8% (hospitals), 17% (insurance companies), 11% (administrative authorities), and 5% (medical controlling agencies) of the cases.

The comparison between the group that completed the survey and the group of caregivers who dropped out revealed no significant differences regarding age, sex, and personality traits (*t* tests for independent samples and Fisher’s exact test:  $P > 0.05$ ).

### Second Victim and Moral Injury Experience in the Sample of Family Caregivers

Of the 31 family caregivers completing the survey, 18 (58% of the completers) acknowledged experiencing SVP, while 12 (39%) denied it. Of those who reported to have experienced SVP, 11

persons reported prolonged effects over 12 months (35%) and 14 (45%) reported not having fully recovered. Consequently, we affirmed hypothesis 1.

Regarding the G-SVESTR subscales among the caregivers who completed the survey, psychological distress mean 3 (SD 1.1), median 3 (Q1 2.3, Q3 4) followed by physical distress mean 2.8 (SD 1), median 2.8 (Q1 2, Q3 3.6) and the lack of institutional support mean 2.5 (SD 1), median 3.3 (Q1 2.3, Q3 4) were the most pronounced. The overall G-SVESTR and G-MISS-HP scores were on average mean 23.2 (SD 13.2), median 21.9 (Q1 18.6, Q3 35.5) and mean 34.5 (SD 13.2), median 35 (Q1 24, Q3 45), respectively.

Pearson’s product-moment correlation matrix between demographic variables age and sex, Big Five personality traits, G-SVESTR subscales and overall G-SVESTR and G-MISS-HP scores revealed that male sex correlated moderately positive with lack of collegial support (Pearson’s correlation coefficient  $[r] = 0.44$ ,  $P = 0.02$ , BCa 95% CI [0.13, 0.74]), while age exhibited no significant correlations with any of the G-SVESTR subscales and overall G-SVESTR as well as G-MISS-HP scores ( $P > 0.05$ ). The G-MISS-HP overall score was strongly positively correlated with the G-MISS-HP overall score ( $r = 0.72$ ,  $P < 0.001$ , BCa 95% CI [0.48, 0.88]). Table 2 displays the product-moment correlation matrix.

### Hypothesis 2

The control group comprised 46 professional nurses who completed the G-MISS-HP validation survey without any missing value for the control variables of age and sex. The mean age was 47.2 (SD 8.3) and median 41.5 (Q1 34.8, Q3 45). In the control group, 39 nurses were female (85%). Bivariate comparisons between the two groups before conducting propensity score matching regarding demographics and G-SVESTR and G-MISS-HP instruments revealed that professional nurses in the control group were significantly younger with a moderate effect size (Mean<sub>nurses</sub> = 47.2, SD<sub>nurses</sub> = 8.3, Mean<sub>family</sub> = 54.1 SD<sub>family</sub> = 12.5,  $t(71) = -2.6$ ,  $P < 0.001$ , Mean<sub>nurses</sub> - Mmean<sub>family</sub> = -0.7, BCa 95% CI [-0.8, -0.1],  $d = -0.7$ ). Furthermore, the case group comprising family caregivers reported higher levels of lack of collegial support than the control group comprising professional nurses (Mean<sub>nurses</sub> = 1, SD<sub>nurses</sub> = 0.7, Mean<sub>family</sub> = 2.4 SD<sub>family</sub> = 0.8,  $t(71) = -2.19$ , Mean<sub>nurses</sub> - Mean<sub>family</sub> = -6.9, BCa 95% CI [-13.4, -0.7],  $d = -0.6$ ). No further significant differences were observed in sex distribution and distribution of applied instruments between case and control group before the matching (Table 3).

In addition, we performed the propensity matching. With the previously described approach, we successfully matched 22 pairs of cases and controls. After the matching process, the observation of propensity score plots revealed a significantly improved balance compared with the prematching state. The distributions of the control variables and applied instruments after propensity score matching are presented in Table 4. The case and control groups did not exhibit significant differences in terms of age and sex, ensuring a balanced sample between the groups. The effect size, considering age difference between cases and controls, was  $d = 0.1$ , indicating a balanced distribution. Both groups comprised 20 females and two males. In addition, no significant differences were observed in the subscales of G-SVESTR and G-SVESTR and G-MISS-HP overall scores (Figs. 1, 2). Therefore, hypothesis 2 was confirmed.

The results also indicated a high response burden, reflected in a high dropout rate. Consequently, we rejected hypothesis 3.

Assessment of the cause of the second victim traumatization was only possible in some cases. Responders reported a) “crying attacks above 100 dB” from the person cared for, b) monitoring

**TABLE 2. Product-Moment Correlation Matrix of Demographic Variables, Big Five Personality Traits, G-SVESTR Subscales, G-SVESTR Overall Score, and G-MISS-HP Overall Score**

Variable	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. Age	r	—																
2. Sex Female = 1, Male = 2	r	0.29																
3. Extraversion	r	-0.17	-0.11															
4. Neuroticism	r	0.20	0.07	-0.27														
5. Openness	r	0.17	-0.08	0.23	-0.02													
6. Conscientiousness	r	0.05	-0.13	0.10	-0.18	0.50 <sup>†</sup>												
7. Agreeableness	r	0.05	-0.13	0.10	-0.18	0.50 <sup>†</sup>	1.00 <sup>†</sup>											
8. G-SVESTR (Psychological Distress)	r	-0.10	0.11	-0.08	0.25	-0.05	-0.11	-0.11	—									
9. G-SVESTR (Physical Distress)	r	-0.01	0.07	-0.15	0.41*	0.00	-0.19	-0.19	0.67 <sup>†</sup>	—								
10. G-SVESTR (Collegial Support)	r	0.24	0.43*	-0.11	0.08	0.12	-0.11	-0.11	0.27	0.36*	—							
11. G-SVESTR (Supervisor Support)	r	0.09	0.02	0.22	-0.06	0.15	-0.23	-0.23	-0.07	0.01	0.18	—						
12. G-SVESTR (Institutional Support)	r	-0.08	-0.31	0.17	0.02	0.24	0.00	-0.12	-0.05	0.12	0.18	0.18	—					
13. G-SVESTR (Professional Self-Efficacy)	r	0.16	0.14	-0.14	0.25	-0.14	-0.38*	-0.38*	0.57 <sup>†</sup>	0.56 <sup>†</sup>	0.63 <sup>†</sup>	0.05	-0.02	—				
14. G-SVESTR (Turnover Intentions)	r	0.37*	-0.31	0.08	0.18	0.13	-0.15	-0.15	0.13	0.39*	0.37*	0.25	0.03	0.54 <sup>†</sup>	—			
15. G-SVESTR (Absenteeism)	r	-0.09	-0.11	-0.35	0.28	-0.05	-0.20	-0.20	0.31	0.38*	0.33	0.15	0.06	0.32	0.33	—		
16. G-SVESTR (Resilience)	r	0.16	0.08	0.10	0.11	-0.20	-0.31	-0.31	-0.35	-0.08	-0.12	-0.25	0.00	-0.02	0.05	-0.18	—	
17. G-SVESTR overall	r	0.16	0.02	-0.08	0.37*	0.02	-0.37*	-0.37*	0.55 <sup>†</sup>	0.74 <sup>†</sup>	0.65 <sup>†</sup>	0.28	0.22	0.80 <sup>†</sup>	0.68 <sup>†</sup>	0.61 <sup>†</sup>	0.03	—
18. G-MISS-HP overall	r	0.3	0.25	-0.26	0.21	-0.01	-0.34	-0.34	0.60 <sup>†</sup>	0.64 <sup>†</sup>	0.51 <sup>†</sup>	-0.04	0.01	0.61 <sup>†</sup>	0.32	0.443*	0.10	0.72 <sup>†</sup>

\*The correlation is significant at the  $P < 0.05$  level.

<sup>†</sup>The correlation is significant at the  $P < 0.01$  level.

r; Pearson's correlation coefficient.

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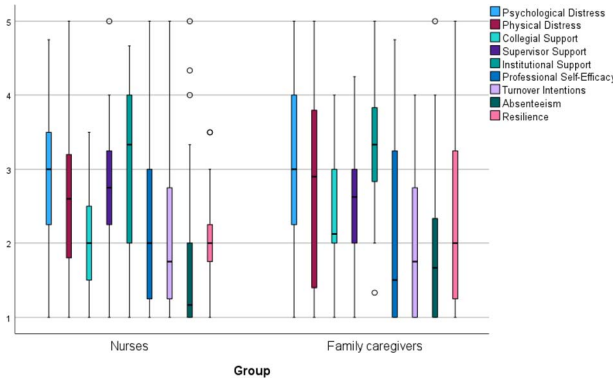
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**TABLE 3. Comparison Between Family Caregivers (Cases) and Professional Nurses (Controls) Prior to the Propensity Score Matching**

Variable	Cases (Family Caregivers), n = 31			Controls (Nurses), n = 46			T Test		BCa 95% CI		Exact Fischer's Test P	
	Mean	SD	Median (Q1, Q3)	%	Mean	SD	Median (Q1, Q3)	n	%	Lower		Upper
Sex												
1. Female				84				39	87			>0.999
2. Male				15				7	13			
Age	54.2	12.6	53	44, 61	41.3	9.4	41.5	34.8, 40		-0.52	0.49	<0.001
Psychological distress	3	1.1	3	2.3, 4	3	1	3	2.3, 3		-0.52	0.60	0.89
Physical distress	2.8	1.1	3	1.6, 3.8	2.8	1	2.8	2, 3.6		-0.80	-0.11	0.89
Collegial support	2.4	0.8	2.3	2, 3	2	0.7	1.8	1.5, 2.6		-0.06	0.78	0.01
Supervisor support	3.4	1	2.5	1.7, 3	3.3	1.1	2.8	1.9, 3.8		-0.59	0.38	0.14
Institutional support	2.5	1	3.3	3.3, 4	2.9	1.2	3.3	2.7, 4		-0.48	0.61	0.67
Professional self-efficacy	2.2	1.2	1.8	1.9, 3.4	2.3	1.1	2	1.3, 3.1		-0.19	0.88	0.84
Turnover intentions	2.1	1.1	1.9	1.2, 2.8	2.5	1.5	2	1.3, 3.6		-0.81	0.40	0.27
Absenteeism	2.3	1.3	2	1.3, 3	2.1	1.2	1.5	1, 2.8		-0.92	0.06	0.24
Resilience	2.4	1.1	2.4	1.4, 3.1	2.1	0.8	2	1.5, 2.6		-2.95	2.08	0.07
G-SVESTR overall	23.2	13.2	21.9	18.6, 35.5	22.8	15.5	21.3	16.5, 27		-5.68	8.20	0.78
G-MISS-HP overall	34.5	13.2	35	24, 45	35.7	15.5	33	24.8, 43.3		-0.52	0.49	0.75

**TABLE 4. Comparison Between Family Caregivers (Cases) and Professional Nurses (Controls) After Propensity Score Matching.**

Variable	Cases (Family Caregivers), n = 22			Controls (Nurses), n = 22			T Test		BCa 95% CI		Exact Fischer's Test P	
	Mean	SD	Median (Q1, Q2)	%	Mean	SD	Median (Q1, Q2)	n	%	Lower		Upper
Sex												
1. Female				20				20	91			>0.999
2. Male				2				2	2			
Age	47.8	9.5	47.0	41.3, 56	47.5	8.2	49.0	42.5, 53.2		-0.68	0.89	0.93
Psychological distress	3.0	1.1	3.0	2.3, 4	2.9	0.9	3.0	2.3, 3.5		-0.86	0.14	0.80
Physical distress	2.7	1.3	2.9	1.4, 3.9	2.7	1.1	2.6	1.8, 3.3		-0.37	0.81	0.97
Collegial support	2.3	0.8	2.1	2, 3	2.0	0.7	2.0	1.4, 2.7		-1.03	0.22	0.12
Supervisor support	2.5	0.9	2.6	2, 3	2.7	1.0	2.8	2.2, 3.3		-0.60	0.91	0.48
Institutional support	3.4	1.0	3.3	2.7, 4	3.0	1.1	3.3	1.9, 4		-0.55	0.86	0.29
Professional self-efficacy	2.1	1.2	1.5	1, 3.3	2.2	1.1	2.0	1.2, 3.1		-0.98	0.47	0.94
Turnover intentions	2.0	1.0	1.8	1, 2.8	2.1	1.2	1.8	1.2, 2.8		-1.00	0.19	0.63
Absenteeism	2.1	1.1	1.7	1, 2.7	1.8	1.2	1.2	1.0, 2		-4.31	2.81	0.49
Resilience	2.4	1.2	2	1.3, 3.2	2.1	0.7	2.0	1.7, 2.4		-7.51	10.31	0.35
G-SVESTR overall	21.4	5.4	20.9	18, 25.1	21.5	6.6	19.5	16.1, 25.2		-0.56	0.71	0.98
G-MISS-HP overall	33.8	13.2	34.5	23.8, 43.5	34.0	14.3	32.5	24.3, 41.5		-0.68	0.89	0.96



**FIGURE 1.** Comparison of nine subscales on the German version of Second Victim Experience and Support Tool (Revised Version): Box plots for 22 cases (family caregivers) and 22 controls (professional nurses). Note. The circles symbolize the outliers.

alarms in hospitals after emergencies, c) being on duty 24/7 and 365 days per year, d) feelings of helplessness in cases of deoxygenation, e) regret and emotional breakdown after being violent toward the person cared for, and f) degradation of their capabilities by professionals. Interestingly, one individual (a medical professional and caregiver) reported experiencing trauma at home but manifesting the consequences of SVP at work.

## DISCUSSION

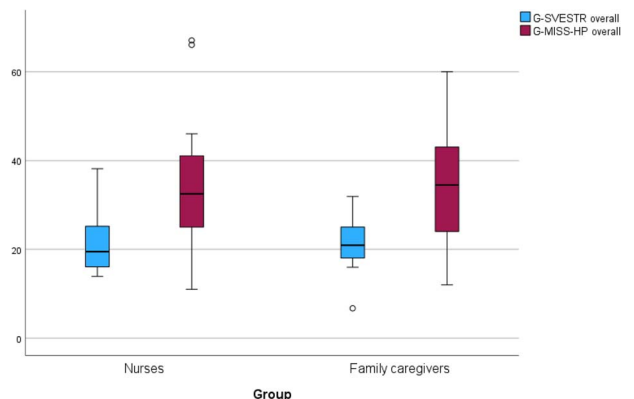
### Main Results

Family caregivers are the backbone of health systems worldwide. In many instances, these individuals are trained by medical professionals to perform tasks usually carried out by medical staff, such as caring for wounds as well as the preparation and administration of drugs. As medical errors continue to be a significant concern in healthcare,<sup>43</sup> the consequences of medical errors on family caregivers remain unknown. Researchers on second victims face uncertainty about whether they fall into the category of “first,” “second,” or carry the burden of both as a “double victim.”

In this initial study with a limited sample size, we observed that family caregivers experience a detectable burden according to the G-SVESTr, and this burden does not exhibit statistically significant differences from that of healthcare providers. This observation is supported by analyses following propensity matching. Furthermore, our analysis revealed a significant elevation in moral injury, as indicated by the G-MISS-HP, suggesting a substantial impact on individuals experiencing traumatizing events like medical errors, even within nonhealthcare staff. Consequently, we affirmed our initial hypothesis that SVP (or SVP-like) issues may emerge after traumatizing events, such as medical errors. To our knowledge, this study represents the first exploration of this specific phenomenon. However, it is worth noting that family caregivers, while not traditionally considered part of the healthcare workforce, face challenging and potentially traumatizing situations. In 1988, Baillie showed that caring for elderly may result in distress, particularly in the absence of adequate support.<sup>44</sup> Similar patterns have been observed in studies referring to palliative care,<sup>45</sup> individuals with mental disorders,<sup>46,47</sup> and those needing long-term care.<sup>48</sup> These studies consistently reported that approximately 50% of family caregivers experience distress. Notably, our analysis detected that 54% were traumatized by SVP. This not only validates our results against existing literature but also raises a critical question regarding the distribution of distress stemming from preventable adverse events.

This is particularly crucial given the prevalence of medical errors, especially medication errors, in family care settings, a phenomenon well-documented in the literature.<sup>49–51</sup> Hence, coping and forgiveness become essential, especially in rural areas,<sup>52</sup> where access to healthcare resources may be limited, and the burden on family caregivers is heightened. In 2008, Reinhard et al described this situation characterizing family caregivers as “secondary patients,”<sup>53</sup> emphasizing the possible interaction between SVP and moral injury that may unintentionally “create” new patients. The identified need for support extends not only to caregivers themselves but also to the family member under their care, emphasizing the importance of addressing these challenges before the possible manifestation of SVP.

For second victim research, our results indicate that the scope of SVP and moral injury may extend beyond healthcare providers.<sup>1,2</sup> Transferring findings from professional care to informal care is not a novel concept. For instance, burnout was originally described in healthcare workers before being recognized in other domains such as informal caregiving.<sup>54,55</sup> Many concepts from work and organizational psychology, such as Job Demands-Resources model, have found application in informal care.<sup>56,57</sup> Hence, family caregivers can experience similar phenomena and encounter comparable challenges to those encountered by professionals. Therefore, they should be recognized as integral members of healthcare teams.<sup>58</sup> This aligns with the literature for moral injury as the term was derived from nonmedical military forces<sup>59,60</sup> and secondarily validated for healthcare<sup>18,19</sup> and showing interaction with second victim effects and the symptom load.<sup>10</sup> However, the elevated MISS-HP scores suggest potential PTSD in family caregivers, prompting consideration for further exploration in future studies. Furthermore, it is noteworthy to emphasize that while SVP and moral injury can lead to PTSD, they are not synonymous. Therefore, additional work is required to categorize the psychological burden of family caregivers in their dual role as both (semi-) professionals and family members. Understanding the factors that precipitate SVP in this population is crucial. Previous research in healthcare providers identified incidents most likely to trigger SVP are a patient’s suicide, unexpected death, unexpected complications, aggression, and mistakes.<sup>6–8,11</sup> In our study, we observed detectable levels of aggression and helplessness, and other issues were also present, such as conditioning to monitoring alarms. This emphasizes the need for a comprehensive exam of the psychological impact on family caregivers in their multifaceted roles, taking into account potential triggers of SVP beyond those observed in healthcare providers.



**FIGURE 2.** Comparison of overall scores of the G-SVESTr and the G-MISS-HP: Box plots for 22 cases (family caregivers) and 22 controls (professional nurses). Note. The circles symbolize the outliers.

Regarding the third hypothesis, we detected a high dropout rate most likely attributable to the response burden associated with the survey's compilation. Consequently, future investigations in larger populations should consider a reduction in items.

The initial findings before propensity matching suggested that male caregivers perceived a higher lack of collegial support compared with females. However, after adjusting for age and sex through propensity matching, the statistically nonsignificant differences indicate that age and sex may have contributed to the initial disparities in perceived support. It is noteworthy that our sample comprised 22 pairs after matching, and within the family caregiver group, there was a lower representation of males and a younger demographic in comparison to 31 caregivers who completed the study. Practically, this could imply that without considering these demographic factors there might be a misleading perception of disparities in support. Social expectations and traditional gender roles may shape the perception that men should be providers rather than caregivers, influencing the support male caregivers receive.<sup>61</sup> Differences in communication styles between men and women could create mismatches in seeking and receiving support.<sup>62</sup> Societal stereotypes and stigmas surrounding male caregiving roles may impact how others perceive and support elderly male caregivers.<sup>63,64</sup> Limited availability of resources tailored to male caregivers may contribute to a lack of appropriate support.<sup>65</sup> Personal reluctance to seek help, especially among older generations, may impact the perceived level of support.<sup>66</sup> In addition, a lack of awareness or acknowledgment within the caregiving community and healthcare systems may exist regarding the specific needs and challenges faced by elderly male caregivers.<sup>67</sup> Therefore, it becomes important to acknowledge and address potential age and gender-related dynamics when designing studies, interventions, or support systems for elderly male caregivers to ensure equitable and effective assistance.<sup>68,69</sup>

Concerning prevention and coping assistance, healthcare providers rely on prevention (level 1), self-care (level 2), support by peers (level 3), structural professional support (level 4), and structural clinical support (level 5).<sup>2</sup> For lay caregivers, most of these levels are not easily accessible: First and second, prevention and self-care for the second victim are not detectable in literature (as it is not described), but self-care and measurements of caregivers' quality of life are widely institutionalized in professionalization programs and curricula in self-help organizations and programs.<sup>70-73</sup> Consequently, coping with medical error should be thematized and included in these existing programs. On levels three and above, support by peers and institutions may be most challenging as—in contrast to hospitals—often no peer is available, and no institution oversees protecting and advising the caregiver. Thus, high-level support for SVP among caregivers should be redefined. The role of professionals (home care and community nurses, general practitioners) and other institutions (self-help organizations, insurance companies, health maintenance organizations) and their education as moderators must be re-evaluated.

### Limitations

Our study faces some limitations. First, the very small sample size<sup>74</sup> may lead to the under detection of further effects demanding future studies in larger populations. The small sample size does not play a major role in our hypothesis as we aimed to detect the phenomenon and not to conduct a representative epidemiological survey. Our main hypothesis, asserting that family caregivers can experience SVP and moral injury phenomena, is grounded in propensity score matching. This method yields similar effect sizes to randomized control trials, as demonstrated by simulation studies.<sup>75</sup> However, to achieve close matching in terms of age and sex, nine caregivers from the case group were excluded from the

analysis, presenting a limitation of the study. On the other hand, the applied precise matching approach significantly enhances the internal validity of our findings. We faced limitations in controlling for potential additional confounders, specifically with regards to variables such as personality traits, notably neuroticism. The absence of personality trait data in the validation study<sup>20</sup> constrained our ability to systematically address these factors in our analysis. However, it is important to acknowledge the possibility of selection bias in this study, as well as in the study from which the comparative data was obtained, because responders may have been preselected based on their interest in the study topic or their manifestation of caregiving strain. Consequently, a survey in a representative sample is needed to clarify the role of SVP and moral injury in family caregivers. The cause for nonparticipation in surveys or preterm termination is mainly speculative. Causes may be abandoned or seldom accessed accounts in social media for the de facto unknown response rate and the high response burden concerning low completion rates. However, the low completion rate is comparable to the literature for online surveys.<sup>76</sup> These issues demand for closed and more direct recruitment and the reduction of items in future studies. Second, our study did not assess caregivers for conditions like posttraumatic stress disorder, depression, or moral distress. Future research should examine their potential impact. While common among caregivers these conditions should not be treated as biases but as integral aspects of the caregiver. In addition, a limitation of our study is that a portion of the caregivers had received formal medical education. This could be considered a limitation because caregivers with formal medical education may have a different perspective or level of understanding compared with those without such education. Their background and training might influence their responses or coping mechanisms, potentially introducing a bias in the study findings. Thus, we can conclude that there is no significant and large effect size difference between caregivers and nurses, but it is important to note that this does not imply an equivalence in the levels of second victim experiences and moral injury between the two groups. The minimum important difference for second victim and moral injury was not established, preventing us from determining whether a significant and meaningful difference could have been reached based on confidence intervals.<sup>77</sup> Furthermore, the term “double victim” was chosen according to reflections on our results and under the common definition.<sup>2,78</sup> With respect to the critics on the denomination,<sup>79</sup> further work on description, ascription, and normativity of the wording is warranted.

### CONCLUSIONS

With respect to the limitations, our study advances the field by being the first to recognize SVP/SVP-like effects in family caregivers, drawing parallels with the burden faced by healthcare providers. This suggests the possibility of expanding the use of the term second victim and extending support programs to encompass lay caregivers working in a medical field. This raises the question of whether this term could be applicable to medical apprentices as well, and if these caregivers might be considered dually traumatized, functioning as both first and second victims—an aspect we refer to as a double victim. However, our preliminary results are constrained by several limitations and require validation through large-scale studies utilizing an adapted instrument to minimize response burden. If confirmed, these findings, along with subsequent prevention and support programs, could contribute to a better care at home.

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