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An Exploration of Safety Culture, Second Victim Phenomenon and Negative Work Outcomes in Health Care Settings

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ABSTRACT

Purpose: The aim of the study was to explore the impact of patient safety culture on nurses' negative work outcomes resulting from patient safety incidents, as well as the mediating roles of second victim support and distress.

Design: A cross-sectional survey was conducted. The participants included 208 nurses, each with over a year of clinical experience, working in hospitals across South Korea.

Methods: Data were collected through self-reported questionnaires on general characteristics, patient safety culture, second victim support and distress, and negative work outcomes. The collected data were analyzed using descriptive statistics, the *t*-test, ANOVA, the Scheffé test, and Pearson correlation coefficients. Additionally, model 6 of Hayes' PROCESS macro and the Sobel test were employed to determine the mediating effect.

Results: Mediation analysis revealed significant indirect effects of patient safety culture on the work outcomes experienced by nurses following patient safety incidents, mediated by second victim distress, after controlling for participants' marital status, position, and the severity of patient safety incidents.

Conclusions: This study demonstrates that in healthcare settings, patient safety culture that supports the second victim and alleviates second victim distress mitigates the negative work outcomes resulting from patient safety incidents. The findings highlight the significance of culturally sensitive support systems, particularly considering the diverse impacts on Korean nurses. Based on this study, healthcare leaders are recommended to develop strategies to support nurses and reduce their second victim distress, which can ultimately improve patient safety and the quality of nursing care.

Clinical Relevance: The findings of this study can be used to develop strategies to support second victims in addressing their distress. Taking steps to alleviate the distress of second victims will help prevent negative work outcomes in nurses.

1 | Introduction

While patient safety is increasingly recognized as an essential component of healthcare quality, adverse events continue to occur and are estimated to affect one in every four hospitalized patients (Grimm 2022; Levinson 2010). Therefore, healthcare staff will inevitably encounter patient safety incidents in the healthcare setting. Efforts should be made to prevent these events, and it is also important to respond effectively when they occur (Conway et al. 2010; Ock et al. 2015).

The term "second victim" which was first used by Wu (2000), is defined as a healthcare worker who is negatively affected by being directly or indirectly involved in an unexpected patient adverse event, unintentional medical error, or patient harm (Vanhaecht et al. 2022). A second victim may experience mental symptoms similar to those of post-traumatic stress disorder, including guilt, frustration, anxiety, and anger, as well as physical distress such as sleep disturbances, increased heart rate and blood pressure, and unsteady breathing. These symptoms have been found to potentially lead to suicide (Busch et al. 2020; Seys et al. 2013; Stovall and Hansen 2021). Negative effects are reported to be experienced by as many as 72.5% of healthcare workers in hospitals (Mira, Carrillo, et al. 2015). The second victim phenomenon refers to the psychological responses of healthcare professionals to patient safety incidents, including near misses, which can be life-altering (Scott et al. 2009; Waterman et al. 2007). This phenomenon not only affects healthcare workers' psychological well-being but also contributes to organizational challenges such as absenteeism and turnover intentions. These outcomes, which are often described as negative work outcomes, disrupt organizational stability and can compromise patient safety and care quality (Burlison et al. 2021). Inadequate mitigation of these experiences can lead to further errors or increase absenteeism and turnover intentions, which in turn undermine patient safety, creating a vicious cycle (Mira, Lorenzo, et al. 2015). A previous study reported that about 13% of second victims considered changing jobs, and about 20% considered changing careers. Specifically, approximately 20% of nurses wanted to leave their jobs if there was no system in place to respond to patient safety incidents (Joesten et al. 2015). The nurse shortage caused by these negative work outcomes not only affects patient safety but also negatively impacts the productivity and performance of healthcare organizations. Therefore, the occurrence of patient safety incidents and their negative outcomes need to be anticipated and managed. Nurses, who provide the most direct care to patients, including administering medication, monitoring vital signs, and maintaining close relationships with patients and their caregivers, are reported to be the most vulnerable among healthcare staff to being blamed for patient safety incidents. They are also more prone to becoming second victims than professionals in other fields (Mohamadi-Bolbanabad et al. 2019; Quillivan et al. 2016; Santana-Domínguez et al. 2022). Therefore, more active management is needed.

Prior research examining factors that influence the experience of second victims has identified the characteristics of the patient safety incident, the traits of the individuals involved, and the environmental characteristics of the institutional setting as influential (Choi et al. 2020; Strametz et al. 2021). Among these environmental characteristics, organizational culture plays a significant role. Patient safety culture is defined as the beliefs, values, and norms shared by healthcare practitioners and other staff in the entire healthcare organization that influence their behaviors and actions to improve patient safety and quality of care (Agency for Healthcare Research and Quality 2019). A positive patient safety culture in a healthcare organization reduces distress for healthcare staff by enabling them to respond effectively to patient safety incidents. Specifically, non-punitive responses, open communication, transparent responses, and thorough investigations have been shown to effectively reduce the distress of second victims and enable them to cope effectively.

Additionally, understanding and support from colleagues and the organization have been shown to help victims recover (Chard 2010; Quillivan et al. 2016; Scott et al. 2009; Serou et al. 2021). Emotional support, through peer support programs or formal support systems, was found to play a crucial role in mitigating the negative emotional and work-related impact of a patient safety incident on healthcare workers (Scott et al. 2009). Adequate support for healthcare workers who have experienced a patient safety event can help them recover quickly and modify their behavior to prevent the same mistakes, as well as better support the patients and caregivers who experienced the event (Busch et al. 2021). Appropriate support has also been shown to mitigate negative occupational consequences of patient safety incidents, such as turnover and absenteeism (Burlison et al. 2021). Ultimately, second victim support plays a crucial role in promoting resilience among healthcare workers, enabling them to establish effective coping strategies for patient safety incidents and reducing the likelihood of negative work outcomes. Important factors of second victim support that have been studied to date include peer support, a culture of solidarity and understanding within the team, and increased awareness of the second victim phenomenon (Busch et al. 2021; Cohen et al. 2023).

Previous studies have explored the relationship between patient safety culture and the support and distress experienced by second victims and have confirmed the impact of patient safety culture on work outcomes (Stovall and Hansen 2021; Zhang et al. 2019). Additionally, research has investigated the effects of support and distress of second victims on work outcomes (Burlison et al. 2021; Mohd Kamaruzaman et al. 2022). However, comprehensive studies examining the relationship between patient safety culture, second victim support and distress, and subsequent work outcomes are scarce.

Several instruments exist to measure patient safety culture in healthcare organizations. One such instrument, the Hospital Survey on Patient Safety Culture (SOPS), was developed by the Agency for Healthcare Research and Quality in the United States. It assesses the extent to which a hospital's organizational culture supports patient safety and safety-related practices. Recently, this tool has been revised and adapted into several country-specific instruments, demonstrating good validity and reliability (Lee and Dahinten 2021; Reis et al. 2023; Suryani et al. 2022). The updated instrument was revised from the standpoint of a "just culture" framework to assess responses to error, and complex survey items were reworded. However, the updated version of the tool has not yet been widely utilized.

The purpose of this study was to examine the relationship between nurses' perceptions of patient safety culture and negative work outcomes resulting from patient safety events and to explore the mediating roles of second victim support and distress. The specific objectives were as follows: (1) to assess the extent of patient safety culture, second victim support, distress, and negative work outcomes as perceived by the participants; (2) to explore differences in patient safety culture, second victim support, distress, and negative work outcomes based on participant characteristics; (3) to investigate the relationships among patient safety culture, second victim support, distress, and negative work outcomes; and (4) to evaluate the impact of patient safety culture on negative work outcomes through the mediation of second victim support and distress. This study may serve as a foundational resource for preventing the second victim phenomenon.

2 | Methods

2.1 | Design

This study involved a descriptive survey designed to explore the mediating effects of support and distress experienced by second victims on the relationship between nurses' perceptions of patient safety culture and the negative work outcomes resulting from patient safety incidents.

2.2 | Participants

The participants in this study were nurses employed at medical institutions in South Korea who held a registered nurse license. The specific inclusion criteria were: (1) Nurses providing direct nursing care at domestic medical institutions, and (2) Those who had experienced at least one patient safety incident (near miss, adverse event, sentinel event) within the past year. Nurses with less than 1 year of clinical experience were excluded from the study, as their professional self-efficacy might not be fully developed (Hwang 2012). The sample size for this study was calculated using G*Power 3.1.9.4 software. The parameters set included an effect size of 0.15 (medium), a significance level of 0.05, a power of h90, and the number of predictors at 16 (13 general characteristics, 3 independent variables) The minimum sample size required was 175. In total, 210 questionnaires were collected, but 2 were excluded due to exceptionally small standard deviations across survey items, which suggested disengagement or mechanical patterns; thus, 208 questionnaires were analyzed to ensure data reliability. The power of this study was determined to be 0.96.

2.3 | Data Collection

This study received approval from the Institutional Review Board of S University (IRB No. 2307/001-009), affiliated with the investigator's institution. Data collection was conducted through an online self-response questionnaire to maintain anonymity and ensure the reliability of the study. This approach was chosen because the questionnaire included questions about experiences with patient safety events, which participants might be hesitant to discuss openly. The data collection period spanned from July 3 to August 10, 2023. The study was promoted by posting the recruitment document on mobile applications commonly used by nurses. Additionally, the snowball sampling method was employed, allowing participants to refer others to the study. The recruitment document outlined the study's purpose and the selection criteria, which were detailed and required respondents to provide written consent before participating. Participants were required to meet all the selection criteria to qualify for the subsequent survey, which took approximately 15 min to complete. Those who agreed to participate were offered a small gift as a token of appreciation.

2.4 | Measures

The instruments used in this study were designed to assess general characteristics and four key constructs: patient safety culture, second victim support, second victim distress, and negative work outcomes. These constructs are integral to understanding the complex interactions that take place following patient safety incidents. All instruments were employed with prior permission and debriefing from the original authors and the development organization.

2.4.1 | Part 1: Patient Safety Culture

Patient safety culture was assessed using the Korean version of the SOPS version 2.0 (AHRQ, 2019), which has been validated and found reliable for Korean clinical nurses. This version was developed by Lee and Dahinten (2021) (K-HSOPSC). The instrument comprises 32 items categorized into 10 subcategories: "Teamwork," "Staffing and Work Pace," "Organizational Learning–Continuous Improvement," "Response to Error," "Supervisor, Manager, or Clinical Leader Support for Patient Safety," "Communication About Error," "Communication Openness," "Reporting Patient Safety Incidents," "Hospital Management Support for Patient Safety," and Handoffs and Information Exchange. Each item is rated on a 5-point Likert scale, where 1 represents "strongly disagree" or "never happens" and 5 represents "strongly agree" or "always happens." Higher scores indicate more positive perceptions of patient safety culture. In the current study, the overall internal consistency of the tool was shown by Cronbach's α of 0.90, and the internal consistency for subcategories was shown by Cronbach's α values ranging from 0.41 to 0.75.

2.4.2 | Part 2: Second Victim Support

Second victim support and distress were assessed using the Korean version of the Second Victim Experience and Support Tool (SVEST), known as K-SVEST. This tool, originally developed by Burlison et al. (2017), was later validated by Kim et al. (2020) specifically for Korean clinical nurses. Support for the second victim was measured using 14 items from the K-SVEST subcategories: "Peer Support," "Supervisor Support," "Institutional Support," and "Other Support". Each item was rated on a 5-point Likert scale, where 1 indicates "not at all" and 5 indicates "very much so." Higher scores reflect greater perceived second victim support. In the current study, the overall internal consistency of the tool was demonstrated by a Cronbach's α of

0.89, and that of the subcategories was shown by Cronbach's α values ranging from 0.43 to 0.74.

2.4.3 | Part 3: Second Victim Distress

The distress experienced by second victims was assessed using 12 items from the K-SVEST subcategories: "Psychological Distress," "Physical Distress," and "Professional Distress." Each item was scored on a 5-point Likert scale, ranging from 1 ("not at all") to 5 ("very much so"), where higher scores indicated greater levels of distress. In the current study, the internal consistency for subcategories was shown by Cronbach's α values ranging from 0.71 to 0.88.

2.4.4 | Part 4: Negative Work Outcomes

Negative work outcomes were assessed using three items from two subcategories of the K-SVEST: "Turnover intention" and "Absenteeism." Each item was evaluated on a 5-point Likert scale, which ranged from 1 ("not at all") to 5 ("very much so"). Higher scores indicated a greater turnover intention or a higher likelihood of absenteeism. In this study, Cronbach's α was calculated to be 0.82.

2.5 | Data Analysis

The collected data were analyzed using IBM SPSS Statistics 27.0 software and the SPSS PROCESS macro (version 4.2). Descriptive statistics provided insights into the general characteristics of the participants and the scores of the variables. Differences in key variables based on demographic characteristics were examined using the *t*-test and one-way analysis of variance. To identify specific group differences following significant main effects, the Scheffé post hoc test was employed due to its robustness in handling multiple comparisons and controlling for type I error. The correlations among the main variables were assessed using Pearson's correlation coefficient. The mediating effects of support and distress experienced by second victims on the relationship between patient safety culture and negative work outcomes resulting from patient safety incidents were analyzed using the PROCESS macro model 6. The significance of the mediating effects was confirmed through nonparametric resampling with bootstrapping methods, analyzing the 95% confidence intervals to determine the significance of the mediation effects. Negative work outcomes were first analyzed as a composite measure to evaluate the overall impact of patient safety culture and second victim distress. Subsequently, turnover intention and absenteeism were examined separately to identify potential differences in their relationships with the predictor and mediator variables.

3 | Results

3.1 | Participants' Characteristics

The analysis of the participants' general characteristics showed an average age of 33.71 ± 4.80 years, with the majority, 142 participants (68.30%), being in their 30s. Women made up 191 of the individuals (91.8%), while staff nurses represented 185 of them (88.9%). Participants with a four-year bachelor's degree totaled 148 (71.2%), and those working more than 40 h per week numbered 171 (82.2%). The general ward was the most common department of employment, comprising 98 individuals (47.1%). The most frequent range of clinical experience was between 3 to 9 years, involving 113 participants (54.3%) (Table 1).

3.2 | Differences in Variables According to General Characteristics

Nurses' perceptions of patient safety culture received a mean score of 3.25 ± 0.50 out of a possible 5 points. The mean score for second victim distress was 3.17 ± 0.71, that for support for second victims was 2.30 ± 0.49, and that for negative work outcomes was 3.26 ± 1.00. To verify the assumption of normality for the study variables, skewness and kurtosis were analyzed. Skewness values ranged from −0.45 to −0.11, and kurtosis values ranged from −0.55 to 0.43; these values were all within ±2, confirming the assumption of a normal distribution (Table 2).

Patient safety culture scores were significantly higher among participants who were over 40 years old ($F = 3.22$, $p < 0.05$), married ($t = -2.19$, $p < 0.05$), charge nurses ($t = -2.63$, $p < 0.05$), as well as those working in outpatient settings ($F = 2.57$, $p < 0.05$), those with more than 10 years of employment ($F = 5.42$, $p < 0.05$), and those working in non-patient contact departments ($t = -2.02$, $p < 0.05$). Second victim distress was significantly higher among staff nurses ($t = -2.06$, $p < 0.05$), and second victim support was significantly higher among married participants ($t = -3.28$, $p < 0.05$). Negative work outcomes were significantly higher when the severity of patient safety incidents was categorized as "major harm or above" ($F = 3.39$, $p < 0.05$).

3.3 | Correlations Among Variables

A significant negative correlation was found between patient safety culture and second victim distress ($r = -0.34$, $p < 0.001$), indicating that a stronger safety culture was associated with lower distress. Patient safety culture also exhibited a positive correlation with second victim support ($r = 0.67$, $p < 0.001$) and a negative correlation with negative work outcomes ($r = -0.39$, $p < 0.001$). When examining the components of negative work outcomes, patient safety culture correlated negatively with both turnover intention ($r = -0.34$, $p < 0.001$) and absenteeism ($r = -0.40$, $p < 0.001$), suggesting that a stronger safety culture is linked to fewer negative outcomes across both measures.

Second victim distress demonstrated a significant negative correlation with support ($r = -0.29$, $p < 0.001$), meaning that higher distress levels were associated with lower perceived support. Additionally, second victim distress showed a significant positive correlation with negative work outcomes overall ($r = 0.67$, $p < 0.001$), as well as with its components—turnover intention ($r = 0.64$, $p < 0.001$) and absenteeism ($r = 0.22$, $p < 0.001$)—indicating that greater distress levels were associated with worse outcomes across these measures. Finally, support for the second victim exhibited a significant negative correlation with negative work outcomes ($r = -0.35$, $p < 0.001$), including turnover

TABLE 1 | Differences in patient safety culture, second victim support, second victim distress, and negative work outcomes according to participants' general characteristics.

		Patient safety culture		Second victim support		Second victim distress		Negative work outcomes	
Characteristics	***n*** **(%) or M ± SD**	**M ± SD**	***t*** **or** ***F*** **(*p*) Scheffé**	**M ± SD**	***t*** **or** ***F*** **(*p*) Scheffé**	**M ± SD**	***t*** **or** ***F*** **(*p*) Scheffé**	**M ± SD**	***t*** **or** ***F*** **(*p*) Scheffé**
Gender									
Male	17 (8.2)	3.12 ± 0.60	−1.18 (0.24)	2.32 ± 0.64	0.12 (0.90)	3.08 ± 0.85	−0.54 (0.59)	3.08 ± 0.131	−0.61 (0.55)
Female	191 (91.8)	3.27 ± 0.49		2.30 ± 0.47		3.18 ± 0.70		3.28 ± 0.97	
Age (year)									
< 30[a]	43 (20.7)	3.27 ± 0.46	3.22 (0.04)	2.28 ± 0.52	0.69 (0.50)	3.25 ± 0.87	1.65 (0.20)	3.30 ± 1.03	0.20 (0.82)
30–39[b]	142 (68.3)	3.21 ± 0.50	b < c	2.29 ± 0.48		3.19 ± 0.66		3.27 ± 1.01	
≥ 40[c]	23 (11.1)	3.49 ± 0.54		2.41 ± 0.42		2.93 ± 0.60		3.14 ± 0.90	
	33.71 ± 4.80								
Religion									
No	137 (65.9)	3.22 ± 0.47	−1.53 (0.13)	2.28 ± 0.43	−0.98 (0.33)	3.16 ± 0.74	−0.41 (0.68)	3.27 ± 0.99	−0.08 (0.94)
Yes	71 (34.1)	3.33 ± 0.56		2.35 ± 0.57		3.20 ± 0.65		3.25 ± 1.02	
Marital status									
Unmarried	105 (50.5)	3.18 ± 0.50	−2.19 (0.03)	2.19 ± 0.48	−3.28 (0.00)	3.17 ± 0.75	0.04 (0.97)	3.25 ± 1.01	0.11 (0.92)
Married	103 (49.5)	3.33 ± 0.50		2.41 ± 0.47		3.17 ± 0.67		3.27 ± 0.99	
Education level									
College	26 (12.5)	3.27 ± 0.42	0.75 (0.48)	2.20 ± 0.47	1.45 (0.24)	3.02 ± 0.68	2.18 (0.12)	3.27 ± 0.98	0.54 (0.58)
University	148 (71.2)	3.23 ± 0.49		2.34 ± 0.47		3.24 ± 0.69		3.21 ± 0.96	
Graduate school	34 (16.3)	3.35 ± 0.61		2.22 ± 0.55		3.01 ± 0.77		3.49 ± 1.16	
Position									
Staff nurse	185 (88.9)	3.22 ± 0.50	−2.63 (0.01)	2.28 ± 0.49	−1.58 (0.12)	3.21 ± 0.69	−2.06 (0.04)	3.27 ± 0.98	0.45 (0.66)
Charge nurse	23 (11.1)	3.51 ± 0.50		2.45 ± 0.46		2.89 ± 0.74		3.17 ± 1.15	
Work hours (/week)									
< 30	2 (1.0)	3.10 ± 0.68	0.30 (0.74)	1.79 ± 0.97	1.67 (0.19)	2.96 ± 1.00	0.23 (0.79)	3.83 ± 0.24	0.42 (0.66)
30–39	35 (16.8)	3.30 ± 0.56		2.23 ± 0.52		3.12 ± 0.69		3.19 ± 1.00	
≥ 40	171 (82.2)	3.25 ± 0.49		2.32 ± 0.47		3.19 ± 0.71		3.27 ± 1.00	

(Continues)

TABLE 1 | (Continued)

Characteristics	*n* (%) or M ± SD	Patient safety culture		Second victim support		Second victim distress		Negative work outcomes	
		M ± SD	*t* or *F* (*p*) Scheffé	M ± SD	*t* or *F* (*p*) Scheffé	M ± SD	*t* or *F* (*p*) Scheffé	M ± SD	*t* or *F* (*p*) Scheffé
Hospital									
Clinic	2 (1.0)	3.52 ± 0.64	1.15 (0.33)	2.71 ± 0.24	0.63 (0.60)	3.63 ± 0.59	0.86 (0.46)	3.17 ± 0.71	0.59 (0.63)
Hospital	23 (11.1)	3.25 ± 0.54		2.25 ± 0.40		2.99 ± 0.76		3.09 ± 1.16	
General hospital	54 (26.0)	3.15 ± 0.41		2.27 ± 0.41		3.17 ± 0.59		3.40 ± 0.69	
Tertiary hospital	129 (62.0)	3.29 ± 0.53		2.31 ± 0.53		3.20 ± 0.75		3.24 ± 1.08	
Unit									
GW[a]	98 (47.1)	3.24 ± 0.52	2.57 (0.04) d > e	2.28 ± 0.49	1.69 (0.15)	3.10 ± 0.71	1.65 (0.16)	3.19 ± 0.96	1.93 (0.11)
ICU or ER[b]	41 (19.7)	3.23 ± 0.46		2.27 ± 0.66		3.34 ± 0.68		3.53 ± 0.97	
OR[c]	27 (13.0)	3.29 ± 0.51		2.33 ± 0.55		3.09 ± 0.82		2.99 ± 1.12	
OPD[d]	16 (7.7)	3.60 ± 0.50		2.59 ± 0.46		3.05 ± 0.64		3.06 ± 1.12	
Others[e]	26 (12.5)	3.10 ± 0.50		2.23 ± 0.49		3.38 ± 0.60		3.50 ± 0.89	
Tenure in hospital (year)									
< 3[a]	36 (17.3)	3.28 ± 0.57	5.42 (0.01) b < c	2.31 ± 0.44	1.09 (0.34)	3.10 ± 0.73	0.59 (0.56)	3.24 ± 0.96	1.59 (0.21)
3–9[b]	113 (54.3)	3.16 ± 0.44		2.26 ± 0.47		3.22 ± 0.66		3.36 ± 0.99	
≥ 10[c]	59 (28.4)	3.42 ± 0.55		2.37 ± 0.54		3.12 ± 0.71		3.08 ± 1.02	
Tenure in unit (year)									
< 3	84 (40.4)	3.23 ± 0.49	0.11 (0.90)	2.29 ± 0.43	0.08 (0.92)	3.26 ± 0.63	1.55 (0.22)	3.43 ± 1.08	2.24 (0.11)
3–9	104 (50.0)	3.27 ± 0.54		2.31 ± 0.52		3.09 ± 0.76		3.12 ± 1.18	
≥ 10	20 (9.6)	3.27 ± 0.41		2.28 ± 0.55		3.27 ± 0.74		3.28 ± 1.00	
Direct interaction with patient									
Yes	200 (96.2)	3.24 ± 0.51	−2.02 (0.05)	2.30 ± 0.03	−0.33 (0.74)	2.94 ± 0.70	0.96 (0.34)	3.28 ± 0.07	1.00 (0.32)
No	8 (3.8)	3.60 ± 0.29		2.36 ± 0.20		3.18 ± 0.87		2.92 ± 0.41	

(Continues)

TABLE 1 | (Continued)

Characteristics	*n* (%) or M ± SD	Patient safety culture		Second victim support		Second victim distress		Negative work outcomes	
		M ± SD	*t* or *F* (*p*) Scheffé	M ± SD	*t* or *F* (*p*) Scheffé	M ± SD	*t* or *F* (*p*) Scheffé	M ± SD	*t* or *F* (*p*) Scheffé
Harm of patient safety incident (Max)									
Near miss[a]	82 (39.4)	3.33 ± 0.54	1.36 (0.26)	3.08 ± 0.77	1.31 (0.27)	3.08 ± 0.77	1.31 (0.27)	3.05 ± 1.07	3.39 (0.02) d > b
No harm[b]	34 (16.3)	3.25 ± 0.55		3.12 ± 0.69		3.12 ± 0.69		3.19 ± 1.12	
Minor harm[c]	60 (28.8)	3.22 ± 0.47		3.30 ± 0.66		3.30 ± 0.66		3.37 ± 0.85	
Major harm or death[d]	32 (15.4)	3.13 ± 0.40		3.23 ± 0.64		3.23 ± 0.64		3.67 ± 0.79	

Note: Hospital classifications: "hospital" refers to small healthcare facilities or clinics; "general hospital" refers to medium-sized facilities with broader services; "tertiary hospital" refers to large institutions offering specialized care and advanced treatments. "Unit" "unit in hospital" and "tenure in unit" apply only to respondents from general and tertiary hospitals, as clinics typically lack distinct departments or units. Superscripts indicate categorical classifications within each variable: (a-c) for age groups, (a-e) for hospital units, (a-c) for tenure in hospital, and (a-d) for harm severity of patient safety incidents.
Abbreviations: ER, emergency room; GW, general ward; ICU, intensive care unit; M, mean; OPD, outpatient department; OR, operating room; SD, standard deviation.

intention ($r = -0.30$, $p < 0.001$) and absenteeism ($r = -0.36$, $p < 0.001$), suggesting that increased support may help mitigate both turnover intention and absenteeism, contributing to better overall work outcomes (Table 2).

3.4 | Mediation Analysis

Before analyzing the mediating effects of second victim support and distress between patient safety culture and negative work outcomes, we assessed the multicollinearity among the independent variables. The variance inflation factor (VIF) ranged from 1.13 to 1.26, which is below the threshold of 10, and tolerance values ranged from 0.54 to 0.89, well above the critical value of 0.10, indicating no multicollinearity issues. The Durbin–Watson statistic was 2.11, close to the standard value of 2, suggesting no autocorrelation of errors. Normality was confirmed through a P–P plot, and homoscedasticity was assessed through a scatterplot of the standardized residuals. To examine the mediating effects of second victim support and distress on the relationship between patient safety culture and negative work outcomes, variables that showed differences in second victim support, distress, and negative work outcomes were controlled. These variables included marital status, position, and the severity of patient safety incidents. Mediation was analyzed using the PROCESS macro model with multiple mediators. Bootstrapping was set to 10,000 samples, and the confidence interval was set at 95%.

As illustrated in Figure 1, patient safety culture significantly influenced support for second victims ($\beta = 0.63$, $p < 0.001$) and reduced distress ($\beta = -0.45$, $p < 0.001$); however, it did not directly affect negative work outcomes. This finding suggests that a positive patient safety culture can increase support for second victims and alleviate their distress, but these factors alone do not directly affect overall negative work outcomes when analyzed as a composite measure. Nonetheless, distress experienced by second victims significantly impacted negative work outcomes ($\beta = 0.83$, $p < 0.001$), suggesting that higher levels of distress among second victims are strongly associated with more frequent negative work outcomes (Table 3).

The direct effect of patient safety culture on overall negative work outcomes was not statistically significant (effect size = −0.27, 95% CI = −0.54 to 0.00; Table 3), and its direct effect on turnover intention was also not significant (effect size = −0.20, 95% CI, −0.50 to 0.10; Table 4). However, its direct effect on absenteeism was significant (effect size = −0.40, 95% CI, −0.75 to −0.05; Table 5). This relationship is illustrated in Figures 2 and 3. The indirect effect of patient safety culture on negative work outcomes, mediated through second victim distress, was significant, with an effect size of −0.26 (95% CI = −0.51 to −0.03). In addition, patient safety culture indirectly influenced both absenteeism and turnover intention through second victim distress. The mediating effect on turnover intention was significant (effect size = −0.23, 95% CI, −0.36 to −0.11), as was the effect on absenteeism (effect size = −0.22, 95% CI, −0.34 to −0.11). These findings highlight that patient safety culture indirectly reduces both turnover intention and absenteeism, and the mediating role of second victim distress is a critical pathway.

TABLE 2 | Correlations among patient safety culture, second victim support, second victim distress, and negative work outcomes.

Variables	Patient safety culture *r* (*p*)	Second victim support *r* (*p*)	Second victim distress *r* (*p*)	Mean ± SD	Skewness	Kurtosis
Patient safety culture				3.25 ± 0.50	−0.11	−0.07
Second victim support	0.67 (< 0.001)			2.30 ± 0.49	−0.12	0.43
Second victim distress	−0.34 (< 0.001)	−0.29 (< 0.001)		3.17 ± 0.71	−0.38	0.04
Negative work outcomes	−0.39 (< 0.001)	−0.35 (< 0.001)	0.67 (< 0.001)	3.26 ± 1.00	−0.45	−0.55
Turnover	−0.34 (< 0.001)	−0.30 (< 0.001)	0.64 (< 0.001)	3.31 ± 1.07	−0.46	−0.62
Absenteeism	−0.40 (< 0.001)	−0.36 (< 0.001)	0.22 (< 0.001)	3.17 ± 1.15	−0.31	−0.81

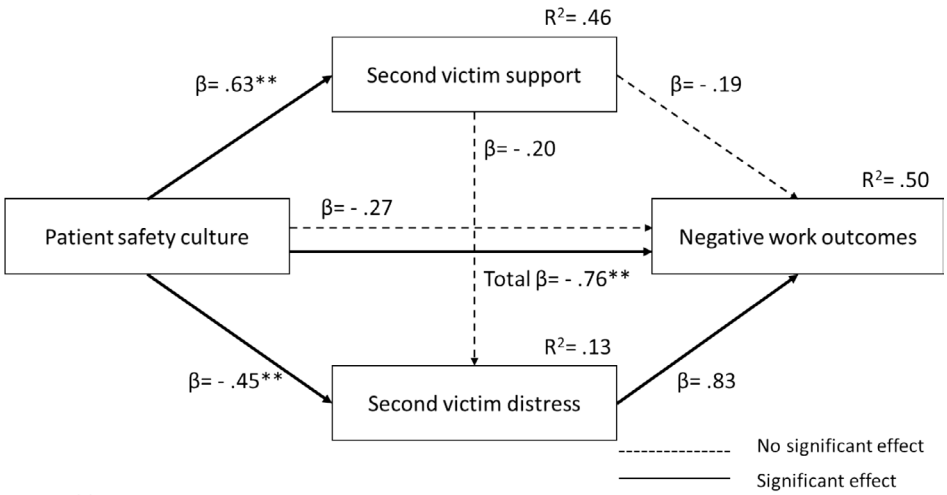

FIGURE 1 | Multiple mediating effects of second victim support and distress on the relationship between patient safety culture and negative work outcomes.

Although patient safety culture does not directly reduce turnover intention, it directly influences absenteeism and indirectly affects both outcomes by alleviating second victim distress. Notably, the total indirect effect, mediated through both second victim support and distress, was also significant, with an effect size of −0.49 (95% CI = −0.73 to −0.25), indicating that these mediators play a crucial role in the relationship between patient safety culture and negative work outcomes. The indirect effect of patient safety culture on negative work outcomes, mediated through second victim support alone, was −0.12 (95% CI = −0.30 to 0.05) and was not significant.

When examining the components of negative work outcomes separately, second victim distress significantly mediated the effect of patient safety culture on both turnover intention ($\beta = -0.23$, $p < 0.001$) and absenteeism ($\beta = -0.22$, $p < 0.001$). The total effect of patient safety culture on negative work outcomes, mediated through both support and distress, was statistically significant, with an effect size of −0.76 (95% CI = −1.02 to −0.50), demonstrating the mediating influence of support and distress in this relationship.

4 | Discussion

This study aimed to explore strategies for preventing and mitigating the second victim phenomenon, which occurs following patient safety incidents. Specifically, we examined the impact of nurses' perceived patient safety culture and the effects of second victim support and distress on negative work outcomes. In an analysis of the mediating roles of second victim support and distress between patient safety culture and negative work outcomes, the results showed that second victim distress directly influenced negative work outcomes, while patient safety culture directly impacted second victim support and distress. Although patient safety culture did not directly affect negative work outcomes, it did influence these outcomes through the mediation of second victim distress.

TABLE 3 | Path coefficients and multiple mediating effects for negative work outcomes.

Direct paths	β	SE	t	p	LLCI	ULCI	F (p)	R^2
PSC → SVS	0.63	0.05	12.29	< 0.001	0.53	0.73	44.05 (< 0.001)	0.46
PSC → SVD	−0.45	0.10	−2.53	< 0.001	−0.63	−0.26	6.61 (< 0.001)	0.13
SVS → SVD	−0.20	0.13	−1.56	0.12	−0.46	0.05		
PSC → NWO	−0.27	0.14	−1.96	0.05	−0.54	0.00	34.05 (< 0.001)	0.50
SVS → NWO	−0.19	0.14	−1.37	0.17	−0.47	0.08		
SVD → NWO	0.83	0.08	11.06	< 0.001	0.68	0.98		

Indirect paths	Effect	Boot SE	Boot LLCI	Boot ULCI
Total indirect effect	−0.49	0.12	−0.73	−0.25
Indirect 1: PSC → SVS → NWO	−0.12	0.09	−0.13	0.05
Indirect 2: PSC → SVD → NWO	−0.26	0.12	−0.51	−0.03
Indirect 3: PSC → SVS → SVD → NWO	−0.11	0.09	−0.29	0.07

Total effect	β	SE	t	p	LLCI	ULCI	F (p)	R^2
X → Y	−0.76	0.13	−5.85	< 0.001	−1.02	−0.50	11.59 (< 0.001)	0.19

Abbreviations: NWO, negative work outcomes; PSC, patient safety culture; SVD, second victim distress; SVS, second victim support.

TABLE 4 | Path coefficients and mediating effects for turnover intention.

Direct paths	β	SE	t	p	LLCI	ULCI	F (p)	R^2
PSC → SVS	0.63	0.05	12.29	< 0.001	0.53	0.73	44.05 (< 0.001)	0.46
PSC → SVD	−0.32	0.13	−2.53	0.01	−0.57	−0.07	6.61 (< 0.001)	0.14
SVS → SVD	−0.20	0.13	−1.56	0.12	−0.46	0.05		
PSC → TI	−0.20	0.15	−1.93	0.19	−0.50	0.10	27.61 (< 0.001)	0.45
SVS → TI	−0.15	0.16	−0.93	0.35	−0.46	0.17		
SVD → TI	0.88	0.09	10.39	< 0.001	0.72	1.05		

Indirect paths	Effect	Boot SE	Boot LLCI	Boot ULCI
Total indirect effect	−0.23	0.06	−0.36	−0.11
Indirect 1: PSC → SVS → TI	−0.04	0.05	−0.15	0.05
Indirect 2: PSC → SVD → TI	−0.13	0.06	−0.25	−0.01
Indirect 3: PSC → SVS → SVD → TI	−0.05	0.04	−0.14	0.03

Total effect	β	SE	t	p	LLCI	ULCI	F (p)	R^2
X → Y	−0.69	0.14	−4.81	< 0.001	−0.97	−0.40	8.67 (< 0.001)	0.15

Abbreviations: NWO, negative work outcomes; PSC, patient safety culture; SVD, second victim distress; SVS, second victim support; TI, turnover intention.

In this study, the average score for nurses' perceived patient safety culture was 3.25 out of 5. This score is similar to or slightly higher than those found in the Korean and Turkish adaptations of the instrument, which were 3.22 (Lee and Dahinten 2021) and 2.99 (Filiz and Yeşildal 2022), respectively. The distress experienced by nurses as second victims of patient safety incidents was scored at 3.17, aligning closely with the scores of 3.22 (Kim et al. 2022) and 3.24 (Kim et al. 2017) from previous studies in a general hospital in Korea. This score is also almost identical to the 3.20 found in China (Zhang et al. 2019) and is slightly lower than the 3.44 reported in a U.S. children's hospital (Burlison et al. 2021). Negative work outcomes, such as turnover intentions and absenteeism among nurses who experienced patient safety incidents, were scored at 3.26. This is similar to the 3.12 found in an earlier Korean study (Kim et al. 2017) but higher than the averages of 2.61 in China (Zhang et al. 2019) and 2.22 for turnover intentions and 1.90 for absenteeism in the U.S. (Burlison et al. 2021). These findings indicate a higher level of negative outcomes compared to other cultures. The average score for support of second victims was 2.30, which is similar to or slightly lower than the scores of 2.43

TABLE 5 | Path coefficients and mediating effects for absenteeism.

Direct paths	*β*	SE	*t*	*p*	LLCI	ULCI	F (*p*)	R^2
PSC → SVS	0.63	0.05	12.29	< 0.001	0.53	0.73	44.05 (< 0.001)	0.46
PSC → SVD	−0.32	0.13	−2.53	0.01	−0.57	−0.07	6.61 (< 0.001)	0.14
SVS → SVD	−0.20	0.13	−1.56	0.12	−0.46	0.05		
PSC → Abs	−0.40	0.18	−2.28	0.02	−0.75	−0.05	19.69 (< 0.001)	0.37
SVS → Abs	−0.28	0.18	−1.55	0.12	−0.64	0.08		
SVD → Abs	0.73	0.10	7.52	< 0.001	0.54	0.93		

Indirect paths	Effect	Boot SE	Boot LLCI	Boot ULCI
Total indirect effect	−0.22	0.06	−0.34	−0.11
Indirect 1: PSC → SVS → Abs	−0.08	0.05	−0.18	0.02
Indirect 2: PSC → SVD → Abs	−0.10	0.05	−0.20	−0.01
Indirect 3: PSC → SVS → SVD → Abs	−0.04	0.04	−0.12	0.02

Total effect	*β*	SE	*t*	*p*	LLCI	ULCI	F (*p*)	R^2
X → Y	−0.91	0.15	−6.04	< 0.001	−1.20	−0.05	10.79 (< 0.001)	0.18

Abbreviations: Abs, absenteeism; NWO, negative work outcomes; PSC, patient safety culture; SVD, second victim distress; SVS, second victim support.

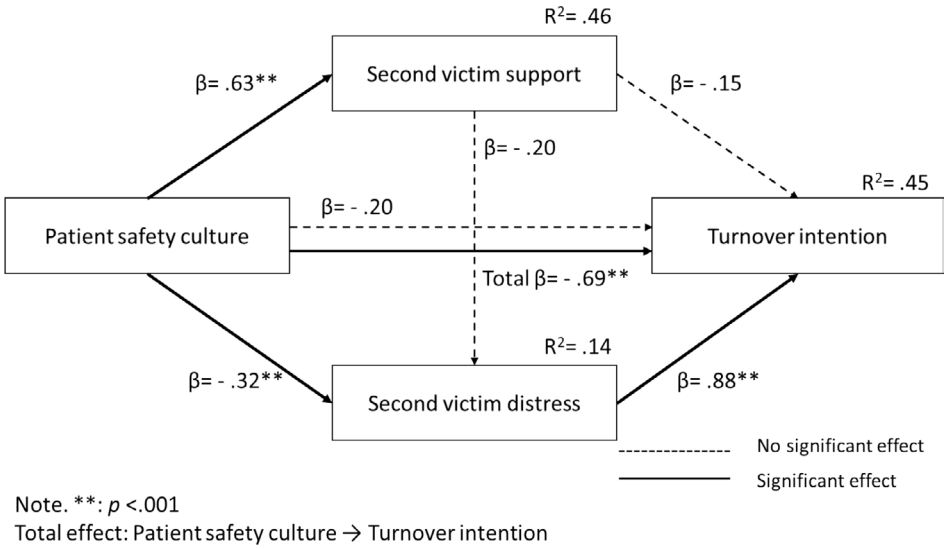

FIGURE 2 | Multiple mediating effects of second victim support and distress on the relationship between patient safety culture and turnover intention.

(Zhang et al. 2019), 2.57 (Mohd Kamaruzaman et al. 2022), and 2.60 (Kim et al. 2017) found in studies involving nurses in China, Malaysia, and Korea, respectively. However, this score is lower than the average of 3.76 found in studies involving U.S. nurses (Quillivan et al. 2016; Burlison et al. 2021), suggesting that support for second victims among nurses in Asia remains lower than in the U.S. In addition to these regional differences, the study sample's characteristics should also be considered when interpreting the findings. The study sample predominantly included nurses in their 30s, with a moderate amount of clinical experience, who worked in general wards. This composition reflects a significant portion of the nursing workforce but may underrepresent other groups, such as nurses in specialized units or those with extended clinical experience. Consequently, caution is required when generalizing these findings to other contexts, particularly where healthcare structures and cultural dynamics differ. However, the results offer meaningful insights into patient safety culture and second victim distress, which may inform interventions in similar healthcare settings.

This study revealed that nurses in Korea perceive patient safety culture and experience distress from patient safety incidents in ways that are comparable to their counterparts in other cultures. However, the adverse effects on work outcomes may be more pronounced, possibly due to a lower level of support for second victims. The study further highlights the need to prioritize

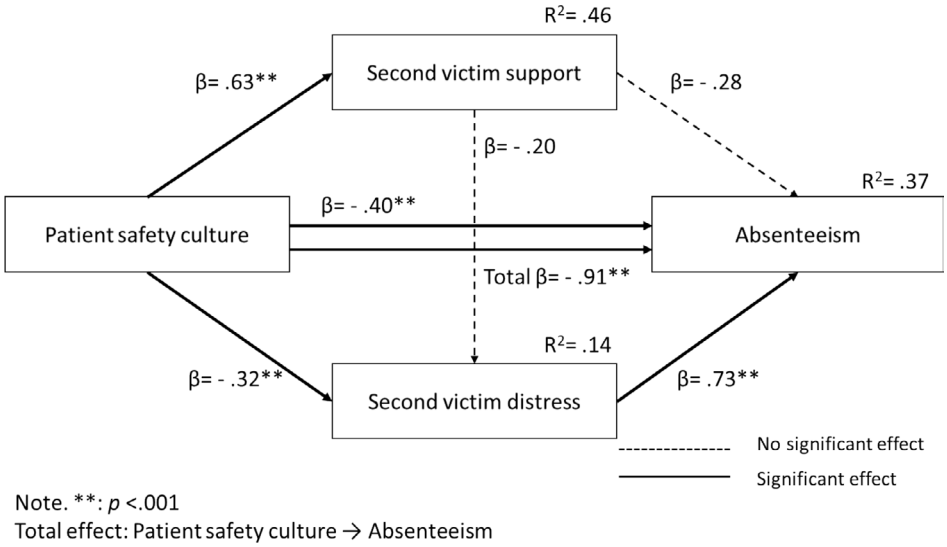

FIGURE 3 | Multiple mediating effects of second victim support and distress on the relationship between patient safety culture and absenteeism.

support for nurses who endure severe patient safety incidents to help mitigate organizational damage.

This study confirmed that patient safety culture is a key factor that directly influences both the support for and the suffering of second victims. Since patient safety culture affects the competence and behaviors of healthcare professionals (Hafezi et al. 2022; Sinurat et al. 2023), it plays a crucial role in both the occurrence and management of patient safety events. In particular, a culture that promotes open communication and collaborative problem-solving not only fosters an environment where healthcare staff can openly discuss patient safety incidents but also improves the management of these incidents and protects second victims through a non-blaming organizational atmosphere (Kim et al. 2022; Sexton et al. 2021; Zhang et al. 2019). This is essential for alleviating the distress of second victims, as it reduces the suffering experienced by healthcare professionals involved in patient safety incidents and provides them with opportunities for support from their peers and the organization.

Although this study did not identify a direct impact of patient safety culture on negative work outcomes through support for second victims, a significant indirect effect was observed through the mediating variable of second victim distress. These results suggest that patient safety culture does not directly influence negative work outcomes but does so indirectly through the complex interactions involving second victim distress. Furthermore, an organizational culture that inadequately manages patient safety incidents by covering up and blaming individuals intensifies the psychological, physical, and professional suffering of second victims who endure these incidents, leading to negative work outcomes (Kim et al. 2022; Zhang et al. 2019) and adversely affecting work outcomes (Burlison et al. 2021; Mohd Kamaruzaman et al. 2022). Therefore, healthcare institutions should prioritize interventions that reduce the suffering of second victims over general support mechanisms. Research has reinforced the concept that improving organizational culture concerning patient safety incidents is as vital as providing adequate support to the victims and is closely linked to alleviating second victim distress.

When analyzing the components of negative work outcomes separately, nuanced patterns emerged. The effect of patient safety culture on turnover intention was fully mediated by second victim distress, aligning with prior studies that highlighted the importance of addressing distress to promote retention and reduce turnover (Burlison et al. 2021). In contrast, absenteeism demonstrated both a direct negative relationship with patient safety culture and an indirect relationship mediated by second victim distress. This suggests that a robust patient safety culture can directly mitigate absenteeism by facilitating psychological safety and organizational stability while also reducing absenteeism indirectly through alleviating second victim distress. These findings highlight the need for distinct strategies to address negative work outcomes. To reduce turnover intention, targeted interventions to alleviate second victim distress appear to be necessary, while absenteeism could be mitigated by both direct improvements in patient safety culture and the organizational stability it fosters.

Support for healthcare professionals who experience patient safety incidents has been shown to mitigate the negative impact on second victims' distress (Quillivan et al. 2016) and work outcomes (Burlison et al. 2021; Mohd Kamaruzaman et al. 2022; Quillivan et al. 2016; Zhang et al. 2019). However, our study did not find significant effects from support for second victims. This may suggest that the level of support for second victims in Korean healthcare institutions is lower compared to that in U.S. studies. Even if nurses perceive that they receive support after experiencing a patient safety incident, the impact may be insufficient to alleviate second victim distress or negative work outcomes. The findings related to absenteeism imply that a well-established patient safety culture can provide an alternative mechanism to address negative work outcomes, even in the absence of sufficient support systems. This highlights the need for tailored interventions to enhance both safety culture and support systems. Moreover, it is necessary to question whether the

current support for second victims in Korean healthcare settings is adequate and aligned with the needs of Korean nurses. The role and effectiveness of the second victim support system in the Korean healthcare context should be reassessed.

Previous research has noted that nurses in Korea are more vulnerable to becoming second victims following patient safety incidents than nurses in other cultures. Support for second victims in Korea is lacking, and the status and effectiveness of victim support systems operated by a few medical institutions remain unclear (Choi et al. 2023). The hierarchical culture prevalent in East Asia may make it difficult for nurses to openly communicate about errors (Lee et al. 2021). Therefore, the interactions between patient safety culture, the second victim phenomenon, and work outcomes should be carefully examined within the cultural context.

In this light, healthcare institutions should focus not only on reducing the number of patient safety incidents but also on adequately supporting nurses who experience these incidents. Creating a patient safety culture that alleviates the distress of second victims and understanding how nurses psychologically process these incidents are crucial. Moreover, it is important to identify the stress and trauma experienced by nurses as second victims in the Korean cultural context, explore the severity of patient safety incidents, and investigate the general characteristics of victims that can modulate the impact of the second victim phenomenon. Organizations must provide appropriate psychological support and recovery mechanisms that reflect victims' needs. This requires resources such as regular training programs, counseling services, peer support groups, and effective communication channels. Adopting strategic approaches to improve patient safety culture and alleviate the distress of second victims is a way for healthcare institutions to meaningfully improve nurses' psychological stability and overall work performance. Ultimately, this will positively affect not only nurse safety but also patient safety and the quality of healthcare services.

4.1 | Limitations

This study has several limitations. First, despite efforts to reduce respondent burden through anonymous reporting, the self-reporting of sensitive issues related to patient safety incidents may lead to underreporting, over reporting, and recall bias. Second, given that this was a cross-sectional study employing multiple mediator analyses, caution must be exercised when inferring causation, and further longitudinal studies are necessary to more thoroughly investigate these phenomena. Third, some subcategories of the patient safety culture measurement exhibited relatively low internal consistency. However, since the most recent version of the tool for measuring patient safety culture was used, comparisons with other studies were challenging. Fourth, responses with extreme biases were excluded to improve data reliability. The exact response rate could not be calculated due to the use of snowball sampling and online survey distribution, which also limited the ability to determine the survey's total reach. This method may have introduced selection bias by overrepresenting individuals with similar experiences, underscoring the need for caution when generalizing the findings to broader populations.

5 | Conclusions

This study demonstrates that an optimal organizational culture in healthcare settings can significantly reduce the distress experienced by nurses as second victims of patient safety incidents, which in turn positively affects work outcomes. Effective strategies, such as peer support systems, emotional debriefing sessions, and structured interventions tailored to the needs of affected individuals, can play a critical role in alleviating distress and strengthening resilience. These approaches underscore the importance of developing comprehensive support systems that address both individual and organizational needs. The results underscore the importance of management strategies aimed at alleviating nurses' distress following such incidents, as negative outcomes like turnover and absenteeism can lead to excessive workloads and job stress, creating a detrimental cycle of staffing shortages. Furthermore, the study found that perceptions of patient safety culture, support, and distress varied significantly based on characteristics. This finding highlights the necessity of tailored interventions that address the specific needs of different nurse groups. Another key finding is that support for second victims did not significantly influence work outcomes within the Korean cultural context, indicating the necessity for support systems that account for cultural, ethnic, and other diverse factors. Healthcare institutions and nursing management should adopt proactive management strategies to cultivate a supportive culture around patient safety incidents and reduce second victim distress, thereby enhancing patient safety and the quality of nursing care. The insights from this study are expected to provide essential data for the development and implementation of strategies aimed at reducing nurses' distress and actively supporting them in the aftermath of patient safety incidents.

Acknowledgments

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Ethics Statement

This study was approved by the Institutional Review Board of Seoul National University (Approval No. 2307/001-009). All procedures with human participants adhered to the ethical standards of the institutional research committee and the 1964 Helsinki Declaration and its amendments.

Conflicts of Interest

The authors declare no conflicts of interest.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Clinical Resources

Agency for Healthcare Research and Quality. Surveys on patient safety culture. https://www.ahrq.gov/sops/index.html.

Quick Safety 39: Supporting Second Victims. https://www.jointcommission.org/resources/news-and-multimedia/newsletters/newsletters/

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