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Research Article

Effect of Nurse Proactive Behavior on Patient Education for Fall Prevention in Acute Settings: A Moderated-Mediation Model

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Introduction. Falls among hospitalized patients continue to pose a serious threat to patient safety worldwide. Effective fall-prevention education is considered vital for fall prevention. Nurses' resilience and proactivity may improve the fall-prevention education nurses provide to patients, but how to motivate nurses' proactivity remains unsolved. This study aimed to examine whether (1) nurse's resilience and social capital are jointly associated with nurse proactivity and (2) adherence to procedures further moderates the relationships between nurse proactivity and the fall prevention education provided to patients by the nurse. *Methods.* A nested (~3 patients per nurse) cross-sectional observational design has been employed in this study. 101 bedside registered nurses were recruited from fourteen internal and surgical wards at a medium-size hospital. For each nurse, ~3 of their newly admitted patients were recruited (total of 271 patients). Nurses completed validated questionnaires on personal resilience, social capital, following procedures, and sociodemographic data. Fall-prevention education was assessed via a short-structured interview with patients. Hypotheses were analyzed using the Hayes PROCESS macro. *Results.* Social capital, nurse resilience, and their interaction were associated with proactive behavior. Proactive behavior, adherence to procedures, and their interaction ($\beta = -0.57$, $p < 0.01$) were associated with patient education for fall prevention given by nurses. The moderated-mediation model was significant under medium and high levels of social capital and low levels of adherence to procedures. *Conclusion.* The study highlights the importance of nurse proactivity in educating patients about fall prevention, especially when adherence to procedures in the ward is perceived as low. Furthermore, nurses' proactivity can be promoted by nurturing both their resilience and their social capital. Nursing managers should nurture proactivity at the work environment of the 21-century, by fostering resilience and enculturing social capital. Concomitantly, employees should be educated at ways to promote personal resilience and engage in wise proactivity.

1. Introduction

Falls among hospitalized patients continue to pose a serious threat to patient safety worldwide [1, 2]. The systematic review by Morris et al., evaluating the effectiveness of existing approaches to decreasing patient falls, indicates that the rate of falls in acute hospitals, geriatric wards, and emergency departments varies from 2 to 8 per 1,000 bed days, with even higher rates in rehabilitation hospitals (3–16 per 1,000 bed days) [3, 4]. Around 30% of hospital falls are estimated to have devastating consequences, including head injuries, fractures, and death [1]. The results of the meta-analysis were inconclusive, concluding that none of the strategies, other than patients' education by staff and environmental adjustment significantly decreased patient falls [1]. Moreover, the authors concluded that any strategy addressing hospital falls as a component of patient safety should incorporate a systematic approach, with crucial support from hospital management [1, 5].

The most prevalent organizational effort for preventing patient falls focuses on developing clear protocols, policies, and procedures [6]. In this vein, the Joint Commission published a comprehensive fall prevention program in healthcare, emphasizing individualized risk assessments,

tailored interventions, a multidisciplinary approach, staff education, and continuous monitoring to enhance patient safety and reduce falls [7–9]. Such procedures can serve as a guide for nurses in assessing, educating, and making clinical decisions. Yet, these strategies (e.g., safety protocols, nurse education, patient education, environmental adaptations, use of assistive devices) are top-down, namely, initiated by hospital management. These "one size fits all" approaches may not adequately capture the complex circumstances that characterize acute-care settings, thus ignoring the fact that patient falls are erratic events and often difficult to predict [10, 11]. Fall-prevention intervention in hospital requires more than just following rules and procedures. These findings call for shifting attention to more self-starting, future-focused, and change-oriented initiatives of bedside nurses to decrease patient falls, such as those focusing on nurses' proactivity [12].

The concept of proactivity involves employees taking charge to make things happen rather than watching them happen [13]. When employees are proactive, they act in advance rather than react. There are several interwoven definite characteristics of proactivity at work. First, it is self-initiated, namely, employees take initiative following their interests, motivations, or beliefs, rather than due to being instructed or demanded to do so by others. Second, it is future-oriented, that is, it involves thinking about the future over a long period of time and acting in advance, rather than reacting to events that have already happened. Third, it is change- oriented, that is, it aspires and strives to improve or alter the status quo in response to anticipated challenges [12].

In nursing, nurses' proactive behavior has been studied and demonstrated to be beneficial [14]. Nurses' proactive behaviors in the operating room (e.g., anticipating surgeons' needs, providing anticipatory assistance, and proactively monitoring patient status during an operation) have been shown to reduce surgical errors [15, 16]. Similarly, introducing an intervention that fosters proactivity in the emergency room demonstrated lower waiting times, hospitalization rates, and hospital length-of-stay in the intervention compared with a control group [17, 18]. Proactivity in the form of offering recommendations to other nurses for reducing errors has led to fewer errors in the future [19]. According to Ferreira et al. [20], nurses' proactive actions can positively affect a variety of areas related to improving nursing practice and maximizing nursing resources. As a result of the nurse's proactive action, best care practices are developed and implemented more effectively. Alternatively, non-proactive attitudes result in nurses acting automatically in their work and failing to anticipate problems [20]. Finally, in the specific area of preventing patients' falls, a recent observational qualitative study conducted by Vechter and Drach-Zahavy [6] demonstrated that nurses engaged in various proactive behaviors to prevent patient falls. For example, they looked for signs indicating that something bad could happen to the patient, checked patients' mobility multiple times during the shift, gained more information for their care, improvised, and increased education for patients at risk. By contrast, nurses who did not

engage in proactive behaviors noted that "taking action is probably unnecessary and redundant, as patients" falls are beyond their control and there is nothing, they could do to prevent their occurrence' [6].

These findings warrant further research on the mutual effects of work procedures and nurse proactivity in decreasing patient falls. According to Parker's conceptualization of proactivity, proactivity's benefits hinge on its wise execution, involving changes that optimize outcomes across task, social, and resource calculations [21]. Strict adherence to procedures in the ward may signal to nurses that proactivity is unnecessary, as it might needlessly deplete nurses' resources and potentially harm relationships with patients or staff [22]. Lower perceptions of adherence, however, act as a signal for nurses to engage proactively, compensating for perceived gaps in-patient safety protocols [23, 24].

The literature review so far has focused on nurse proactivity and the circumstances (i.e., low compared with high perceived work procedures) under which proactivity is successful. We now turn to the personal and contextual antecedents of proactivity [21, 24]. In line with previous studies [6], we chose to focus on personal resilience, namely, the ability of individuals to proactively monitor and anticipate problems, to bounce back or cope successfully despite adverse circumstances, and to restore safe conditions after adverse events occur [25]. According to a qualitative study, nurses characterized by resilience anticipated that the patients might deteriorate and initiated behaviors that prevented patients from falling [6]. However, based on Parker's theory of wise proactivity, participating in proactive behavior may pose psychological risks, demanding significant persistence and potentially depleting psychological resources, even for high-resilience nurses [22, 26]. Thus, we assume that nurses will be better able to engage in proactive behaviors when they have both internal resources captured by resilience and external resources embedded in social capital.

In short, social capital encompasses augmented resources obtained from personal networks, allowing employees to identify proactive opportunities [27]. Workplace social capital for nurses is defined as shared assets within social relationships at work [28]. It comprises structural, relational, and cognitive dimensions, facilitating information flow, trust, commitment, and common context, which collectively motivate proactivity [28]. We hypothesized that social capital moderates the relationship between personal resilience and proactivity, as it provides resilient nurses external structural, relational, and cognitive resource pools essential to engaging in proactive behaviors. By contrast, when social capital is low, resilient nurses may lack the resources to engage in proactive behavior.

This study aims to develop and examine a moderated-mediation model for proactivity in preventing patient falls (Figure 1).

The model suggests that nurse proactivity is the product of personality, in terms of nurse resilience and situational factors—perceived social capital. The model further suggests that the link between proactivity and preventing falls will be moderated by perceived procedures in the ward. Preventing
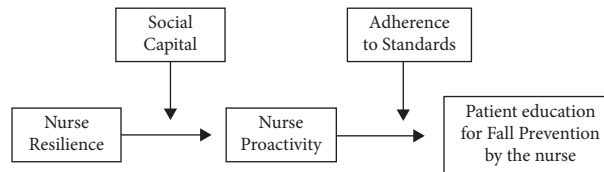
FIGURE 1: The research model.

falls in this study was measured in terms of the patient's understanding of the education provided to them about decreasing fall risks.

2. Materials and Methods

2.1. Design. The study employed a cross-sectional, observational design.

2.2. Settings. The study was conducted in 14 acute-care adult wards of the internal medical and surgical departments of a medium-sized hospital ($N = 506$ beds), Hillel Yaffe Medical Center, Hadera, Israel. In Israel, each nurse is required to provide patients with education on how to prevent falls based on Joint Commission for Accreditation of Health Care Organizations (JCI), Hospital Standards Manual: Fall Reduction Program—NPSG—Goal 9—09.02.01 [7].

2.3. Participants. The sample included 101 bedside nurses and ~3 of their newly admitted patients. All participating nurses met the following inclusion criteria: (a) a bedside registered nurse, (b) with at least 1 year of experience, (c) having direct responsibility for a newly admitted patient. Participating newly admitted patients met the following inclusion criteria: age greater than 18 years, stable health condition, normal cognitive and mental functioning, and comprehension of the Hebrew language. Patients were excluded if they were too ill to provide informed consent, as determined by hospital staff, or unconscious or diagnosed with cognitive impairment. Sample size of 101 nurses, with an average of 3 patients per nurse (total of 271 patients), was calculated according to recommendation of Snijders for mixed model analyzes, considering a medium effect size, a power of 0.80, and a significance level of 0.05.

From seven to eight nurses were selected via a convenience sampling method from all nurses working in the 14 wards. For each nurse, three different encounters with newly admitted patients (~3 encounters per nurse with three different patients) were randomly selected. Data were collected from March through December 2021. The research questionnaires were distributed to the nurses during their break time. The dependent variable of fall-prevention education was assessed with a short-structured interview with patients after their admission, conducted by research assistant, a nurse by profession. To ensure nurses' confidentiality, nurses labeled their questionnaires with a 4-digit code, to allow us to combine nurse and patient data.

2.4. Measures. Resilience was assessed with the six-item Brief Resilience Scale (BRS), adopted from Smith et al. [29]. Nurses assessed on a 6-point Likert-type scale (1 = strongly disagree; 6 = strongly agree) their agreement with the items. An example item is: "It does not take me long to recover from a stressful event" (Cronbach's Alpha in previous studies ranged from 0.80 to 0.91 [29], and in this study, α was 0.70).

Proactive behaviors were assessed with a three-item scale developed by Miron-Spektor et al. [30]. Nurses were asked to report on a 6-point Likert-type scale the frequency with which they engaged in the behavior (1 = very infrequently; 6 = very frequently). An example item is "How frequently do you try to implement solutions to pressing organization problems?" (Cronbach's Alpha in previous studies was 0.75 [30], and in this study, $\alpha = 0.70$).

Social capital was assessed with a questionnaire developed by Bolino et al. [22], consisting of three subscales capturing the three dimensions of social capital: structural, relational, and cognitive. Two items addressed the structural dimension of social capital, for example, "Meeting between nurses tends to be very informal in nature"; four items addressed the relational dimension, for example, "Overall, nurses at this hospital are trustworthy"; and four items addressed the cognitive dimension, for example, "Nurses share the same vision for the hospital." Nurses reported on a 6-point Likert-type scale (1 = strongly disagree; 6 = strongly agree) their agreement with each item. To obtain the social capital score, we averaged the items across the three subscales (Cronbach's Alpha in previous studies ranged from −0.91 [22], and in this study, $\alpha = 0.85$).

Adherence to procedures was measured with a five-item scale adopted from Miron-Spektor et al. [30]. Nurses were asked to rate on a 6-point Likert-type scale (1 = strongly disagree; 6 = strongly agree) their agreement with each item, for example, "I make extensive use of the standards of our organization/ward" (Cronbach's Alpha on Previous studies was 0.79, and in this study, α was 0.78).

Patient education for fall prevention was assessed with a short, three-item structured interview with patients at bedside. The interview items were "Please explain your understanding of why the hand bracelet is assigned to you"; "Please explain the medications you consume and how they might affect your risk of falling"; "Please clarify how you were taught to behave to reduce the risk of falling." The interviewer, a nurse by profession, rated the patient's response on a 3-point Likert-type scale (1 = not at all, 2 = partial, 3 = complete). Items were rated on a 3-point

Likert-type scale (1 = not at all, 2 = partial, 3 = complete). Several steps were taken to validate the interview items. The internal reliability Cronbach's Alpha was 0.74. The content validity index (CVI), capturing the extent to which the items reflect what they are intended to measure, was calculated. Twenty-two experts were asked to examine each item and to answer questions rated on a 5-point Likert-type scale (1 = not relevant; 5 = very relevant). Example items are "Are all the questionnaire items clear?"; "Do the questionnaire items cover all the components of effective fall-prevention patient education?"; and "Should items be added or removed to cover the subject?" The experts were three nurse experts, three managers, five preceptors, four nurses' educators, and seven bedside nurses. The item CVI, calculated as the proportion of participants rating the item as relevant/very relevant and averaged across items, was 0.97. This index is high and exceeds the acceptable standard of 0.80 recommended by Polit and Beck [31]. Finally, the criterion validity of the tool was established by calculating the correlation between this new index and the checklist required by JCI [7] regulations ($r = 0.809$).

Control variables. We controlled for the effects of nurse's gender, seniority, and job percentage, as these variables have been shown to affect the quality of nurses' care [32].

2.5. Statistical Analysis.

Analysis was conducted with SPSS version 25. Descriptive statistics included means and standard deviations for continuous variables and percentages and ranges for nominal variables. A bivariate correlation matrix for all study variables was also calculated. To test the hypotheses, we averaged patient education scores across encounters, as the ICC revealed that there was negligible variance within a nurse across the three patients. Next, we analyzed the hypotheses using Hayes' PROCESS macro [33] (Model 21). The model is based on ordinary least squares with error terms calculated by bootstrapping for models based entirely on observed variables. The indirect effects and 95% bias-corrected confidence intervals were estimated using 5,000 bootstrap samples [34]. The statistical significance was based on a p value of 0.05.

2.6. Ethical Consideration.

The researchers ensured the confidentiality and security of all participants using anonymous questionnaires. Participation in the study was on a voluntary basis. The study was approved by the university's Committee for Ethical Research with Humans (#2294) and Hillel Yaffe Medical Center Helsinki Committee; approval number was HYMC-0091-20. All participants (nurses and patients) provided written informed consent.

3. Results

3.1. Sample Characteristics.

A total of 101 nurses and 271 patients participated in the study. The rate response of nurse participants was 100%. Among nursing staff, 71 were female (66.4%), the average age was 37 (±10) years, 69 (68%) had

professional experience of 10 years or less, and 70 (68.5%) were employed full-time (Table 1).

Table 2 presents characteristics of the patient population. Patients were predominantly female (158; 57.9%), the average age was 61.5 (±18) years, most had a basic education (177; 65.5%) and nearly half were living with their families (136; 50.2%).

Table 3 shows the means, standard deviations, and correlations for the main variables in our study. We observe that the three demographic variables gender, seniority, and job percentage were structurally associated with the main variable; therefore, we added these as control variables to the regression.

Significant positive correlations were found between nurse resilience and nurse's proactive behaviors ($r = 0.24$, $p < 0.05$) and between nurse resilience and social capital ($r = 0.23$, $p < 0.05$), whereas no significant correlation was found between nurse resilience and patient education ($p > 0.05$). Furthermore, significant positive correlations were found between social capital and proactivity ($r = 0.28$, $p < 0.01$) and between social capital and adherence to procedures ($r = 0.30$, $p < 0.01$), whereas the correlation between social capital and patient education was not significant ($p > 0.05$). Finally, a significant positive correlation was found between nurse proactivity and adherence to procedures ($r = 0.41$, $p < 0.01$), whereas the correlation between proactivity and patient education was not significant ($p > 0.05$). These findings provide initial support for our moderated-mediation model, suggesting that the relationship between nurse resilience and patient education are not direct but that proactivity is instead the product of the interaction effect of resilience and social capital, and that it thus affects patients' education through the moderated effect of adherence to procedures.

To test the joint effect of nurse resilience and social capital that will promote patient education for fall prevention through its relationship with proactive behavior, and consequently, increase the outcomes of patient education only under high as compared with low level of adherence to procedures, which referred to the moderated-mediation model, we employed Hayes's PROCESS analysis [26] (Model 21). To test the association between proactive behavior and patient education for fall prevention, we analyzed the direct effects of proactive behavior, adherence to procedures, and their interaction on patient education for fall prevention (Table 4, patient education column). Proactive behavior ($\beta = 3.01$, $p < 0.01$) and adherence to procedures ($\beta = 2.69$, $p < 0.01$) were positively associated with patient education.

Table 4 presents the results of the regression analyzes.

The effect of two levels of social capital (high and medium) and one level of adherence to procedures (low) on the association between nurse's personal resilience and patient education for fall prevention in the mediation of nurse's proactive behavior is presented in Table 4.

Additionally, we analyzed the effect of the control variables (gender, seniority, and job percentage), and the independent variables of nurse resilience and social capital and their interaction on proactive behavior (Table 4, patient

Table 1: Sociodemographic characteristics and working data of the study sample: nurses ($n = 101$).

Age mean ± SD	37.34 ± 10.10 (min = 24, max = 66)
Gender n (%)	
Male	30 (33.6)
Female	71 (66.4)
Level of education n (%)	
First-level degree (bachelor's in nursing or equivalent title)	82 (80.2)
Second-level degree (MA)	19 (19.8)
Post-registration courses (specialist programs) n (%)	42 (41.2)
Years of work experience	Mean 8.76 ± 9.67 (min = 1, max = 45)
<10 n (%)	69 (68)
10–20 n (%)	18 (18.1)
<20 n (%)	13 (12.9)
Working area n (%)	
General hospital wards	57 (57.8)
Surgical hospital wards	43 (42.2)
Job percentage	
Full time job	70 (68.5)
Part time job	31 (31.5)

Table 2: Sociodemographic characteristics of the study sample: patients ($n = 271$).

Age mean ± SD	61.50 ± 18.41 (min = 18, max = 97)
Gender n (%)	
Male	158 (57.9)
Female	113 (43.1)
Residence status n (%)	
Living alone	47 (17.3)
Living with partner	61 (22.5)
Living with family	136 (50.2)
Living with caregiver	27 (10)
Level of education n (%)	
No education	2 (0.7)
Primary school	94 (35.6)
Secondary school	83 (29.9)
High school	34 (12.8)
Academic	58 (21.7)

education column). Seniority and job percentage were positively and significantly associated with proactive behavior ($\beta = 0.11$, $p < 0.05$; $\beta = 0.27$, $p < 0.05$) respectively. Social capital ($\beta = 0.13$, $p < 0.06$) was positively associated with nurse resilience ($\beta = 0.18$, $p < 0.05$), as was the two-way interaction effect of resilience and social capital ($\beta = 3.01$, $p < 0.01$). The interaction effect exhibited in Figure 2 suggests that the positive association between nurse resilience and proactive behavior was stronger as social capital increased.

Finally, the two-way interaction effect of proactivity and adherence to procedures was significant ($\beta = -0.57$, $p < 0.01$; Figure 3). The higher the adherence to procedures, the more negative the relationship between nurse's proactivity and patient education, as presented in Figure 3.

The whole model was significant under high and medium levels of social capital, and low level of adherence to procedures on the association between nurse resilience and

patient education in the mediation of proactive behavior, as shown in the bottom of Table 4. The association between personal resilience and patient education was no longer significant under joint circumstances of low nurse perceive of social capital and two levels (high and medium) of adherence to procedures.

4. Discussion

To reduce the incidence and severity of falls among hospitalized patients, this study explored novel ways to improve their fall-prevention education by nurses. Ultimately, the findings show that nurse proactivity plays a critical role in improving fall-prevention education of patients, but they also identify nuances of the organizational strategies that can nurture proactivity and ensure its success. Briefly, the findings show that nurses' personal resilience and social capital are jointly essential for nurturing proactivity. Also, proactivity is associated with better patient education by nurses precisely when ward procedures are perceived as low, forcing the nurse to initiate behaviors to ensure patients' safety. In this way, the findings extend current knowledge on nursing safety care, personal resilience and proactivity in several ways.

First, as opposed to previous findings showing a positive relationship between personal resilience and nurses' work behaviors such as better performance of nursing care [35, 36] or enhanced safety performance for nursing staff [37], our study showed, that nurse resilience alone is not sufficient to motivate proactive behavior, as the relationship between nurses' proactivity and outcomes critically depends on their perception of social capital. A possible explanation for the discrepancy between our findings and those of others is that proactivity is a resource-consuming activity [12, 21]. Despite the fact that personal resilience, by definition, refers to the ability to anticipate, prepare for, cope with, and adapt to adverse circumstances, all characteristics of proactive

TABLE 3: Means, standard deviations, and correlations.

Variables	Mean	SD	1	2	3	4	5
(1) Patient education	4.33	0.84	(0.74)				
(2) Nurse resilience	5.01	0.57	0.13	(0.70)			
(3) Proactive behavior	4.62	0.80	−0.12	0.24*	(0.75)		
(4) Social capital	5.50	0.51	−0.12	0.23*	0.28**	(0.85)	
(5) Adherence to standards	4.16	0.61	−0.05	0.23*	41**	0.30**	(0.78)

$N = 101$. Internal reliabilities (alpha coefficients) are in parentheses on the diagonal. $^*p < 0.05$, $^{**}p < 0.01$.

behavior [6], nurses may not behave in accordance with their own tendencies in the workplace, if they lack adequate resources to do so [12, 21]. Accordingly, our findings show that proactive behavior occurs only when personal resilience (i.e., an internal resource) is paired with high perceptions of social capital (i.e., an external resource). In order for high-resilient nurses to act proactively, they must believe they are operating on "safe ground," which is a ward with open communication channels among leaders and co-workers and trusting relationships and shared goals. By contrast, a low level of social capital, personal resilience, or both discouraged nurses from taking proactive measures.

Another interesting insight is that proactivity is not always effective in-patient fall-prevention education. In contrast to studies showing direct positive relationships between nurses' proactivity and reduced care errors [19], prioritizing patient needs beyond organizational issues and cost-efficiency [18], and initiating behaviors to prevent patient falls [6], our study showed that acting proactively may not always be effective. Proactivity was associated with higher levels of patients' understanding the provided education only when nurses perceived low procedures on the ward; nursing proactivity was not associated with it when nurses perceived a high level of procedures. This finding accords with Parker et al. s' wise proactivity model, which asserts that successful proactivity depends critically on the proactive person's detailed understanding of the strategic and relational circumstances prevalent in the ward and their own resource capacity to execute the innovation. Thus, nurses' perception of low procedures in the ward signals that proactivity is needed to improve patient care. Under these circumstances, the nurse senses that proactivity may align with patients' interests, will draw few or no sanctions from co-workers, and thus that resource investment in proactivity is wise. Alternatively, when procedures are regarded as high, nurses may believe that patient care is guaranteed, and thus that their actions are unwarranted. A high perception of ward procedures does not motivate nurses to act proactively, because there is no need (low "reason to") and little inspiration (low "energized to") to do so [12, 38].

Furthermore, our findings support previous studies demonstrating that strict enforcement of fall-prevention procedures does not guarantee reduced rates of falls in hospitals [1]. Conversely, as mentioned, perceived low levels of procedures led to proactive behavior to ensure patient safety. The f findings in line with Katz-Navon et al, who found that too many and too detailed procedures may de-emphasize safety prioritization and increase medication errors. However, our finding may explain why low perceived procedures improve patient safety: the perception of low procedures may motivate nurses to act proactively because it may provide both the "reason to" and the "motivation to" ensure patient safety. In other words, proactivity may compensate for low procedures, and, vice versa, high procedures may compensate for low proactivity, highlighting the urgent need for managers to find ways to balance between the two.

Finally, our findings support our overall moderation-mediated model demonstrating that personal resilience is not directly linked to fall-prevention patient education, as might be expected from previous studies on nurses' resilience [39, 40]. Instead, our findings indicate that nurses' proactive behavior plays a key role in this link and delineate the nuanced strategies organizations should employ to cultivate proactivity, and to guarantee its success.

4.1. Limitations and Suggestions for Further Research. Our study employed a cross-sectional design, which limits our ability to provide causal explanations. As for the study measures, nurse proactivity was assessed via a self-reported questionnaire that could be biased. Moreover, the "good impression bias" resulting from the presence of an observer in patient-provider encounters is considered minimal, given that healthcare providers typically acclimate swiftly to the observer's presence and tend to manifest their natural behavior [41]. It is essential to note that certain factors, such as the ward's risk systems and staff training, known to reduce patient falls and patients' delirium and cognitive impairment, known to enhance it were not considered in our study. These elements could be explored in future studies, possibly in conjunction with nurses' resilience and proactivity. Additionally, future investigations might delve into managerial strategies (e.g., leadership style; [35]) or personal characteristics (e.g., paradoxical thinking; [30]) that enable nurses to navigate the paradox between adhering to procedures and acting proactively.

TABLE 4: Predicting patient education: a moderated mediation model (hayes, model 21).

Variables	Proactive behavior						Patient education			
	Model 1: controls		Model 2: direct effects		Model 3: moderation		Model 4: controls		Model 5: mediator	
	b	SE	b	SE	b	SE	b	SE	B	SE
Gender	−0.118	0.145	−0.102	0.139	−0.022	0.144	−0.191	0.112	−0.253*	0.108
Seniority	0.006	0.005*	0.007	0.005*	0.005	0.005*	0.011	0.005*	0.011*	0.005*
Job percentage	0.021	0.115*	−0.009	0.115*	−0.051	0.115*	0.245	0.115*	0.272*	0.115*
Nurse resilience			0.128!	0.069	−0.575	0.334			0.068	0.052
Social capital			0.177*	0.071	−0.450	0.297				
Resilience * social capital					0.154*	0.072				
Adherence to procedures									2.691**	−0.567**
Proactive behavior									3.012**	0.943
Adherence to procedures * proactive behavior									−0.567**	0.169
Intercept	5.102**	−12.21**	3.741**	−12.21**	6.501**	−12.21**	2.235*	−12.21**	−12.21**	−12.21**
$F_{(df)}$	$F_{(3)} = 0.487$		$F_{(5)} = 2.873^{*}$		$F_{(6)} = 2.945^{*}$		$F_{(3)} = 2.847^{*}$		$F_{(6)} = 3.752^{*}$	
R^2	0.015		0.13		0.16		0.08		0.23	

Indirect effect: Nurse resilience ⟶ Proactive behavior ⟶ Patient education for fall prevention

Social capital	Procedure	Effect	BootSE	BootLLCI	BootULCI
4.7500	5.0000	0.0299	0.0255	−0.1024	0.0847
4.7500	5.6000	−0.0249	0.0170	−0.0653	0.0001
4.7500	6.0000	−0.0614	0.0333	−0.1339	−0.0035
5.5000	5.0000	0.0508	0.0416	−0.0227	0.1418
5.5000	5.6000	−0.0422	0.0270	−0.1078	−0.0045
5.5000	6.0000	−0.1042	0.0491	−0.2216	−0.0263

Index of moderated moderated mediation

Index	BootSE	BootLLCI	BootULCI
−0.0875	0.0577	−0.2232	−0.0103

Indices of conditional moderated mediation by social capital

Procedures	Index	BootSE	BootLLCI	BootULCI
5.0000	0.276	0.0274	−0.0154	0.0917
5.6000	−0.248	0.0193	−0.0744	−0.0008
6.0000	−0.598	0.0368	−0.1519	−0.0083

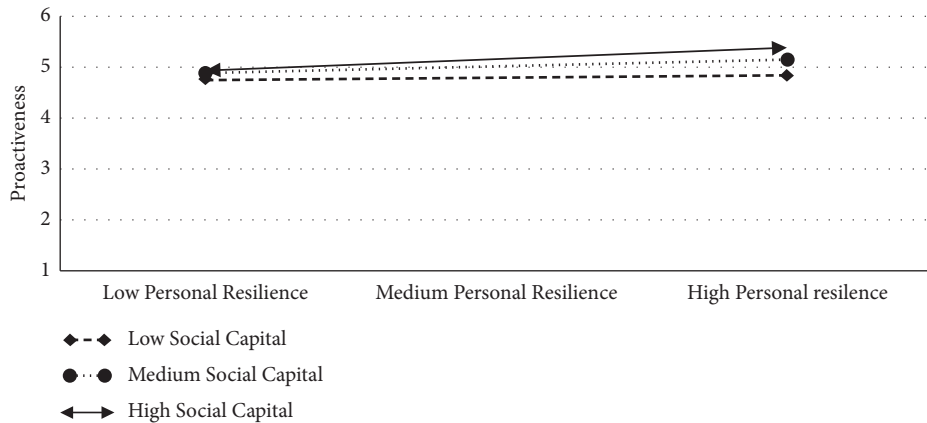!$p < 0.06$; * $p < 0.05$; ** $p < 0.01$.

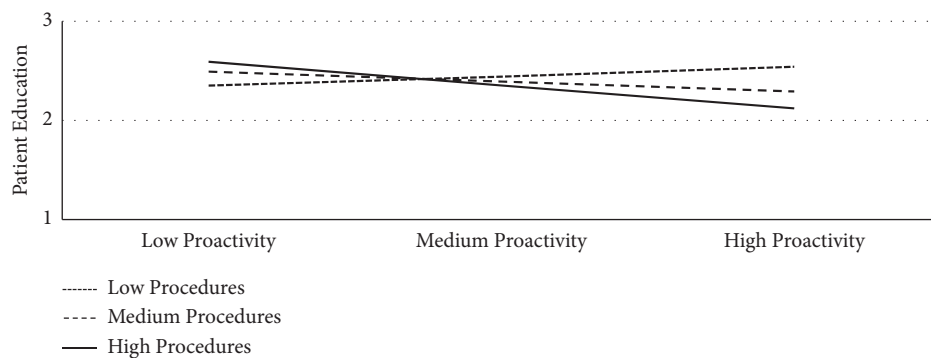FIGURE 2: Proactivity by nurse's resilience and social capital.

FIGURE 3: Patient education by proactivity and procedures.

5. Conclusion

The study focused on nurse proactivity and highlighted its role in in educating patients about fall prevention by the nurse. In line with Parker et al.'s wise proactivity model, we found that the additive effects of personal resilience as an internal resource and social capital as an external resource were associated with nurse proactivity. Furthermore, our findings demonstrated that low perceptions of the ward's procedures motivated nurses to act proactively on behalf of patients' education for fall prevention [42, 43].

6. Practical Implications

The results hold significant implications for nursing leaders and managers striving to minimize in-patient falls by promoting safe and quality care among nurses through the cultivation of workplace proactivity. Recognizing that proactivity consumes resources and may impact the well-being of proactive nurses, organizations should support such behavior by providing backup, acknowledging proactive efforts, and fostering a secure environment. Additionally, in building social capital as a resource reservoir, organizations should establish open communication channels and emphasize the development of a shared vision. Concomitantly, nurses should be educated at ways to promote personal resilience and engage in wise proactivity.

Data Availability

The processed data are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

Acknowledgments

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