Effect of patient Safety Culture on the Nurses's professional Behavior: A Field Trial Study

Abstract

Introduction & Objective: Patient safety is one of the fundamental pillars of healthcare and plays a crucial role in the quality of nursing services. Promoting a culture of safety can enhance nurses' professional behavior and help prevent medical errors. Therefore, this study was conducted to determine the effect of patient safety culture on the Nurses's professional Behavior.

Materials & Methods: In this randomized field trial, 84 eligible nurses from hospitals in Yasuj were randomly assigned to intervention and control groups using block randomization. Data on professional behavior of the nurses were collected both before the intervention and one month afterward. The collected data were analyzed using SPSS version 21, with a 95% confidence level. Chi-square, independent t-test, and paired t-test were used for statistical analysis.

Results: After the intervention, there was a statistically significant difference in the overall professional behavior scores between the intervention and control groups, with mean (SD) scores of 96.40 (12.70) and 52.00 (9.40), respectively ($P < 0.0001$).

Conclusion: patient safety culture led to an improvement in the nurses's professional Behavior.

Keywords: Patients, Safety Culture, Behavior, Nurses

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1. Introduction

Across the globe, healthcare leaders continue to face a complex set of challenges in delivering high-quality care. Patient safety and quality of care are two of the most pressing concerns in global health systems (1). Today, medical errors frequently result in patient harm and, in many cases, even death. These errors—such as medication mistakes, delayed referrals, and inadequate follow-up—occur with concerning regularity and directly impact patient safety (2).

Nursing activities are closely tied to patient safety. For example, nurses play key roles in medication administration, infection control, and fall prevention. As such, their efforts to promote patient safety are vital (3). To implement effective safety strategies, healthcare organizations must adopt a "safety culture" model (4). One definition of patient safety culture is "an organization's willingness and ability to understand safety (and its risks), as well as its willingness and ability to act toward safety" (5).

Patient safety culture reflects the level of commitment, leadership style, and competency within healthcare institutions. The development of this culture can be influenced by the professional behavior of healthcare staff—behavior that is itself shaped by organizational management (6). Professional behavior is a fundamental concept in nursing, referring to adherence to specific behavioral standards that improve care performance. It is essential for the effective execution of nursing duties and is directly linked to both performance outcomes and patient results (7). Education in patient safety culture plays an important role in medical sciences by promoting proactive engagement in identifying and addressing patient safety issues (8).

Agbar et al. demonstrated that patient safety programs can positively influence and improve the culture of safety among healthcare personnel (9). Similarly, Rahimi et al. found that patient safety culture should be integrated into quality and safety improvement initiatives in patient care. They emphasized the need for non-punitive safety policies, staff support, and effective educational programs in hospitals (10).

Despite the recognized importance of patient safety culture, few studies have directly and purposefully investigated its impact on professional behavior of the nurses in clinical settings. Most existing research has been descriptive and has not employed randomized controlled designs. This highlights a clear need for further investigation into the effects of safety culture on professional behavior of the nurses. The lack of definitive and reliable evidence in this area has created a gap in the literature. The present study aims to address this gap and provide scientific evidence on the subject. Therefore, this research was conducted to determine the effect of patient safety culture on the Nurses's professional Behavior.

2. Materials and Methods

This study was an interventional, controlled conducted in the field trial in 2021 on 84 nurses working in hospitals affiliated with Yasuj University of Medical Sciences. Participants were selected through convenience sampling and were randomly assigned using block randomization into two equal groups: intervention (n = 42) and control (n = 42).

The sample size was calculated using G*Power software version 3.1.9.7, considering a type I error (alpha) of 0.01, a confidence level of 99%, a type II error (beta) of 0.10, and a test power of 90%. Based on these parameters, the required number of participants in each group was calculated to be 34.63. Accounting for a 20% potential dropout rate, the final sample size was determined to be 42 participants per group, totaling 84 participants.

Inclusion criteria included: having a bachelor's or master's degree in nursing, the ability to communicate and respond to questions, willingness to participate in the study, and active employment in a teaching hospital. Exclusion criteria were: unwillingness to continue participation, prior involvement in similar studies within the last six months, and obtaining a score of 64 or higher on the Nursing Students Professional Behaviors Scale (NSPBS).

The present study was approved by the Ethics Committee of Yasuj University of Medical Sciences, with the ethical approval code IR.YUMS.REC.1398.125, issued by the Research Deputy of the Vice-Chancellor for Research and Technology. Data were collected using a demographic information form and the Nursing Students Professional Behaviors Scale (NSPBS).

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The NSPBS was developed by Goz and Geckil in 2010 to assess the professional behaviors of nursing students. It contains 27 items covering three dimensions: Health Care Practices (items 1, 3, 4, 6, 8, 9, 10, 12, 16–21, 23, 25–27), Activity Practices (items 2, 5, 7, 11, 13–15), and Reporting (items 22, 24). Each item is rated on a 5-point Likert scale: 5 (strongly agree) to 1 (strongly disagree). The total score ranges from 27 to 135, with higher scores indicating higher levels of professional nursing behavior (11). The scale's validity was confirmed by Heshmati Nabavi et al. in 2014, who reported a Cronbach's alpha of 0.76 for the overall scale (12). In the current study, Cronbach's alpha ranged from 0.69 to 0.80 across subscales and was 0.71 for the total scale.

Data collection involved in-person interviews, during which participants were screened according to the inclusion criteria and signed informed consent forms. They were then provided with the demographic form and the NSPBS questionnaire. The intervention was conducted in a designated room within one of the hospital wards affiliated with Yasuj University of Medical Sciences. Prior to the intervention, participants in the intervention group were briefed about group rules and responsibilities. The intervention sessions, conducted by the researcher in group format, consisted of four 120-minute sessions over the course of one month. The control group did not receive any educational intervention. One month after the completion of the intervention, the professional behavior of the nurses was re-assessed using the NSPBS.

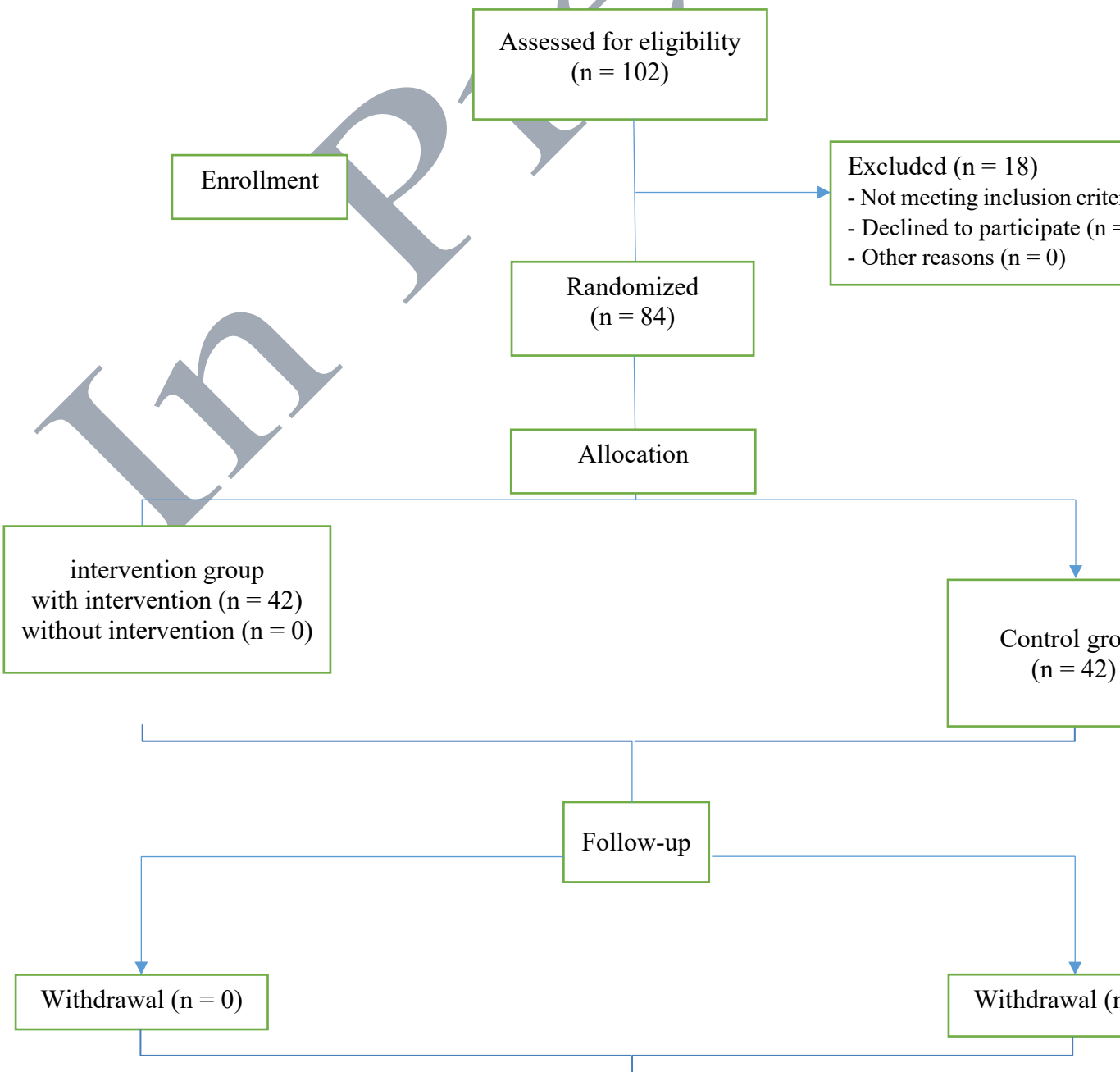

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Figure 1. Consort flow diagram

2.1. Data Analysis

The collected data were analyzed using SPSS software version 21 with Chi-square, independent t-test, and paired t-tests. A significance level of 0.01 was considered for all tests.

3. Results

In this study, 84 nurses participated, and all remained until the end of the study. Therefore, no sample attrition occurred, and the data from all participants were included in the analysis. The mean and SD age of the participants was 31.40 ± 4.60 years old (Table 1).

Table 1. Comparison of Demographic Characteristics in All Three Study Groups

Row	Variable \ Group		Intervention (n= 42) mean ± SD	Control (n= 42) mean ± SD	Level of significance
1	Age (years old)		31.4 ± 3.8	31.4 ± 5.4	0.89*
2	Work experience (years)		6.3 ± 7.7	6.3 ± 6.5	0.93*
Variable			**Intervention (n= 42) No. (%)**	**Control (n= 42) No. (%)**	**Level of significance**
3	Gender	Male	19 (45.2)	13 (31.00)	0.18**
		Female	23 (54.8)	29 (69.00)	
4	Education level	Bachelor's degree	38 (90.5)	36 (85.7)	0.50**
		Master's degree	4 (9.5)	6 (14.3)	
5	Marital status	Single	17 (40.5)	19 (45.2)	0.66**
		Married	25 (59.5)	23 (54.8)	
6	Work unit	Internal medicine	8 (19.00)	11 (26.1)	0.94**
		Surgery	8 (19.00)	6 (14.3)	
		OB/GYN[a] / Labor and Deliver /Pediatrics	5 (11.9)	6 (14.3)	
		ED[b]/Operating Room	13 (31.00)	13 (31.00)	
		Intensive Care Unit	6 (14.3)	5 (11.9)	
		Nursing Office	2 (4.8)	1 (2.4)	
7	Hospital	Shahid Beheshti	14 (33.3)	15 (35.7)	0.78**
		Imam Sajjad	13 (31.00)	15 (35.7)	
		Martyr Dr. Jalil	15 (35.7)	12 (28.6)	

*** Independent t-test, ** Chi-square test / a. Obstetrics and Gynecology, b. Emergency Department**

There was no statistically significant difference in the mean (SD) of the overall professional behavior of the nurses scores and its subscales between the two groups

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before the intervention (P > 0.05), indicating baseline similarity between the intervention and control groups. However, between-group comparison after the intervention revealed a statistically significant difference in the mean (SD) of overall professional behavior of the nurses and its subscales (P < 0.0001).
Additionally, intra-group comparisons were conducted to examine changes within each group separately. The results showed a statistically significant improvement in the intervention group before and after the intervention (P < 0.0001), while no significant change was observed in the control group (P > 0.05) (Table 2).

Table 2: Comparison of the mean and SD of overall the nurses's professional behavior scores and its subscales in both study groups

Variable	Group	Intervention		Control		Level of significance (between groups)*
		Mean	SD	Mean	SD	
Overall nurses's professional behavior	Before intervention	52.4	4.3	51.1	3.7	0.14
	After intervention	96.4	12.7	52.00	9.4	0.0001
	Level of significance (intra-group)**	P < 0.0001		0.57		-
Health Care Practices	Before intervention	36.1	2.7	35.3	2.2	0.14
	After intervention	67.9	9.8	36.7	7.1	0.0001
	Level of significance (intra-group)**	P < 0.0001		0.24		-
Activity Practices	Before intervention	11.7	2.1	11.5	1.9	0.66
	After intervention	20.9	3.4	10.8	2.8	0.0001
	Level of significance (intra-group)**	P < 0.0001		0.24		-
Reporting	Before intervention	4.6	0.9	4.3	1.1	0.20
	After intervention	7.6	0.7	4.5	1.9	0.0001
	Level of significance (intra-group)**	P < 0.0001		0.52		-

*** Independent t-test, ** Paired t-test**

4. Discussion

This study was conducted to determine the effect of patient safety culture on the Nurses's professional Behavior. The findings revealed that one month after the intervention, the mean score of professional behavior of nurses in the intervention group increased significantly compared to the control group (*P* < 0.0001). Implementing a patient safety culture had a positive impact on enhancing professional behavior of nurses, which aligns with the results of studies by Berry et al. (2020) (13), Sortedahl et al. (2020) (14), and Dyrbye et al. (2020) (15).
Similarly, Ayu Eka et al. (2024) emphasized the necessity for nurse educators to model professional behavior and actively promote a culture of professional nursing care during the COVID-19 pandemic to ensure full presence and comprehensive care delivery (16), which is consistent with the present study. Furthermore, Lee and Kwon (2024) found that ensuring patient safety through the creation of safe work environments and fostering an organizational culture that prioritizes patient safety are essential steps to encourage nurses to raise concerns and openly discuss safety-related issues, including their own behaviors (17). These findings support the current study as well.
Measuring patient safety culture provides an opportunity to identify shared areas for quality improvement, reducing the likelihood of adverse events and enhancing the overall quality of care. Moreover, quality improvement strategies are aligned with the promotion of patient safety culture within hospitals. Therefore, educational programs for healthcare professionals should incorporate more content related to patient safety, particularly emphasizing communication, leadership, non-punitive error reporting, quality improvement, and teamwork (18).
Based on the findings of this study, it can be concluded that implementing a patient safety culture is both essential and impactful in promoting professional behavior of nurses. Notably, this study also observed improvements in communication skills and teamwork capabilities among nurses following

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the intervention. In line with this, Yayeh et al. (2025) reported that caring behaviors among nurses are influenced by factors such as professional satisfaction, job satisfaction, low workload, and good relationships with colleagues, all of which contribute to improved quality of nursing care (19). Additionally, Masibo et al. (2024) found that professional performance in nursing is not gender-dependent, and that nurses' perceptions of their profession, institutional factors, and opportunities for professional development significantly impact their performance (20).

Among the strengths of this study is the selection of two critical variables—patient safety and professional behavior—both of which are vital to improving the quality of nursing services. Furthermore, the integration of safety and professional behavior concepts, which are often studied separately, adds value and novelty to this research.

However, the study also had limitations. One limitation was the use of self-report questionnaires to assess professional behaviors, without incorporating complementary tools such as direct observation or performance evaluations. Another limitation was the possibility that the self-reported data might not fully reflect participants' actual behavior. Moreover, the study did not simultaneously assess other potential psychological or environmental factors that may influence professional behavior.

Given these findings, and considering that this study was conducted solely in teaching hospitals in Yasuj, it is recommended that similar research be carried out in other hospitals across the country. Since the participants in this study were exclusively nurses—and given that other healthcare professionals also play a role in patient safety and the development of its culture—it is also suggested that future studies explore the role of other healthcare team members in fostering a patient safety culture. Additionally, future research could investigate the impact of patient safety culture on patient care outcomes at the hospital level.

5. Conclusion

The findings of this study indicate that the implementation of patient safety culture has a significant and positive impact on the nurses's professional behavior. Therefore, if the effectiveness of such interventions is confirmed in future studies, it can be recommended that healthcare personnel, particularly nurses, incorporate such training programs into their professional development initiatives.

One of the key factors related to nurses's professional behavior is the underreporting of adverse events. This may occur for several reasons, such as the perception that the incident is insignificant, the belief that the event was unavoidable, lack of awareness regarding unsafe care situations, or fear of leaving a record of error attributed to the healthcare team. To establish an effective safety culture, it appears essential that incident reporting be based on the timing of patient harm, and that preventable events be systematically analyzed and addressed through strategic planning to improve safety conditions.

Another important consideration is nurses' belief in the positive or negative consequences of incident reporting for management and healthcare organizations. In this regard, designing and implementing educational programs on patient safety culture would be highly beneficial for controlling and improving safety-related behaviors and promoting appropriate professional physical engagement. Such training could ultimately lead to safer care environments and more responsible professional conduct within healthcare settings.

6. Conflict of Interest

The authors declare no conflict of interest in this study.

7. Acknowledgements

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8. Financial Support

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