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## Effect of training program about PDCA process of quality on nurse interns practice of patient safety goals at the college of nursing, ABHA, King Khalid University

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### Abstract

**Background:** Patient safety is a relatively new concern in healthcare organizations. The most widely used approach for managing patient safety in this sector is the PDCA (Plan-Do-Check-Act) cycle, which is a powerful tool for quality management that maximizes organizational efficiency while also improving patient outcomes. The present study aimed to assess the effect of training program regarding the use of PDCA process of quality on nurse interns' practice regarding patient safety goals. The current study was carried out using a quasi-experimental design.

**Setting:** All of Asir Hospital's inpatient wards in the Kingdom of Saudi Arabia, where students complete their internship year, served as the study's training sites.

**Subject:** A simple random sample of fifty nursing interns who graduated in the academic year (2021/2022) and completed their internship training year at Asir Hospital and gave their consent to be included in the study. Data was gathered using an observation checklist designed for nursing interns.

**Results:** Prior to the program's implementation, all nursing interns had inadequate practice level, but following the program, the greatest proportion of nurse interns (83.3%) had adequate level of practice.

**Conclusion:** It is concluded that the training program improved nurse interns' practice regarding application of PDCA for patient safety goals.

**Recommendation:** It is recommended that nurse interns should be attending certified training courses in PDCA.

**Keywords:** PDCA, Nurse interns, patient safety goals, practice, quality, training program

### Introduction

Patient safety, which involves minimizing and eliminating medical errors that frequently have detrimental effects on health, is a new healthcare concern in hospitals these days. With the increased use of new technologies and treatments, health care has become both more complex and efficient. As a result, it is necessary to adopt international patient safety goals in order to enhance patient safety, mimic global competition, and boost healthcare organizations' competitive advantages at both the national and international levels. (Abousallah, 2018) [1].

The Joint Commission International (JCI) (2011) established global patient safety objectives that may be used to evaluate the management of nurses and reduce medical errors in care settings. The six goals are as follows: (a) Accurate patient identification; (b) Enhancing communication; (c) Preserving the safety of high alert medications; (d) Ensuring proper procedure; (e) Lowering the risk of infections linked to healthcare; and (f) Lowering the risk of patient injury from falls.

It is imperative that nurses adhere to established protocols for patient safety. It's also important to evaluate how well nurses understood the patient safety goal statements. In addition, nurses need to be competent in creating, conveying, and implementing these patient safety objectives to other healthcare professionals who work under their direction. To effectively implement patient safety goals in the unit, nurses require a tool or strategy to implement these goals effectively. (Yuswardi *et al.*, 2015) [19].

The plan-do-check-act (PDCA) cycle, often known as the Deming model, is the approach used in healthcare most frequently for patient safety management.

The components of the PDCA model are (a) plan, identifying, establishing informed goals, setting guidelines, and analyzing the problems, establishing objectives, and how they will be achieved. (b) do, putting the plan into practice, highlighting accountability, outlining instructions and motivating employees; (c) check, analyzing results, monitoring staff, carrying out audit programs, and adjusting the plan to achieve implementation. (d) act, implementing systemic adjustments, assessing the program, managing personnel, updating the program, and educating personnel. About the nurses' management of patient safety, each will be covered in more detail. (Boonyoung *et al.* 2013) [3]. Staff nurses' understanding and use of the plan-do-check-act (PDCA) quality cycle in patient safety goals would improve as a result of the training program's implementation. Using the PDCA cycle is more efficient than using the best course of action the first time. Applying the PDCA cycle entails consistently seeking out more effective ways to improve. The PDCA cycle works well for tasks and program management. (Seliem *et al.*, 2018) [13].

### The aim of the study

The purpose of this study to assess the effect of training program regarding the use of PDCA process of quality on nursing interns ' practice for patient safety goals through.

### Research Hypothesis

The practice levels of nursing interns regarding the use of PDCA for patient safety goals will be improved after implementing a training program.

### Subject and methods

#### Research-design

For conducting the study, a quasi-experimental design was adopted.

#### Setting

The study was carried out in all of the inpatient departments of the Kingdom of Saudi Arabia's Asir Hospital, where nurse interns are trained.

#### Subjects

This study contained a simple random sample of thirtynurse interns who completed their internship training year at Asir Hospital and gave their consent to participate. The interns were graduated in the academic year 2021/2022.

#### Tools of Data Collection

Observation checklist for nursing interns this tool was developed by Seliem (2018) [13] to evaluate the PDCA cycle performance of nursing interns in relation to the six patient safety goals both before and after the program's implementation. Included information on the identification of

nursing interns as well as a checklist for performance based on six patient safety goals: Accurately identifying patients, enhancing effective communication, keeping high alert levels of medication, verifying proper procedure, lowering the risk of infections linked to healthcare, and lowering the risk of falls.

### Scoring system

The answers on the observation checklist indicated which things were done with a score of "1" and which ones were not, scoring "0." The items' scores were added together for each area, and the total was divided by the total number of items to determine the area's mean score. The percentage scores for these scores were computed. If the score was 60% or higher, the practice levels were deemed adequate; if it was less than 60%, the levels were deemed inadequate. Cronbach alpha, the tool's reliability, was 0.82.

### Statistical analysis

The Statistical Package Social Science SPSS version 20 program was used to analyze the data statistically. Absolute frequencies (Number) and relative frequencies (Percentage) were used to express qualitative data. It was determined that a P value of less than 0.05 was statistically significant (S), a P value of less than 0.001 Was Highly Statistically Significant (HS), and a p-value of more than 0.05 was Statistically Insignificant (NS).

### Results

**Table 1:** Personal characteristics of nurse interns in the study sample (N=30)

Personal Characteristics	(N=30)	
	No	%
<b>Age in year</b>		
<21	13	43.3
22+	17	56.7
Mean +SD	21.5±6.2	
<b>Marital status</b>		
Single	10	33.3
Married	20	66.7
Attend previous training course regarding Patient safety		
	0	0.0

Table 1 the table indicates that 66.7% of nursing interns were married. This was the greatest percentage. With a mean age of 21.5 years, slightly more than half of the nursing interns (56.7%) belonged to the age group equal to or older than twenty-two years. None of the nursing interns had taken any prior patient safety training courses.

**Table 2:** Practice of plan-do-check-act (PDCA) in patient safety among nurse interns throughout the program phases (N=30)

Practice of PDCA	Time				X2 Test	P-Value
	Pre (N=30)		Post (N=30)			
	No	%	No	%		
<b>Identify patient correctly</b>						
Plan	0	0.00	21	70.0	34.00	<0.001
Do	0	0.00	24	80	39.00	<0.001
Check	0	0.00	13	43.3	16.56	<0.001
Act	0	0.00	20	66.7	29.90	<0.001
<b>Effective communication</b>						
Plan	0	0.00	26	86.7	45.09	<0.001
Do	2	6.7	27	90	46.56	<0.001
Check	0	0.00	21	70.0	32.64	<0.001
Act	0	0.00	26	86.7	50.40	<0.001
<b>High alert medications</b>						

Plan	0	0.00	22	73.3	36.31	<0.001
Do	0	0.00	23	76.7	39.67	<0.001
Check	0	0.00	9	30	Fisher	<0.001
Act	0	0.00	26	86.7	44.00	<0.001
<b>Correct procedures</b>						
Plan	2	6.7	26	86.7	45.80	<0.001
Do	0	0.00	27	90	55.00	<0.001
Check	0	0.00	6	20	Fisher	0.057
Act	0	0.00	0	0.00	0.00	1.00
<b>Nosocomial infections reduction</b>						
Plan	0	0.00	25	83.3	46.18	<0.001
Do	0	0.00	25	83.3	40.00	<0.001
Check	0	0.00	26	86.7	47.09	<0.001
Act	0	0.00	24	80	41.84	<0.001
<b>Fall risk reduction</b>						
Plan	0	0.00	28	93.3	51.40	<0.001
Do	0	0.00	30	100.0	60.00	<0.001
Check	0	0.00	30	100.0	60.00	<0.001
Act	0	0.00	20	66.7	29.87	<0.001
<b>Total practice levels No %</b>						
Adequate (60%+)	0	0.00	25	83.3		
Inadequate (<60%)	30	100.0	5	16.7		

Table 2 The table indicates that there are statistically significant differences across nurse interns throughout the program phases in all dimensions of practice relating PDCA ( $p < 0.001$ ). Additionally, this table demonstrates that before to the program's implementation, all nurse interns had inadequate practice level whereas 83.3% of them had adequate practice level following the program's implementation. Additionally, this table shows that there are statistically significant differences ( $p < 0.001$ ) across all dimensions of PDCA practice among nurse interns across the program phases.

**Table 3:** Relation between nurse interns practice levels regarding plan-do-check-act (PDCA) in patient safety, and their personal characteristics after program implementation (N=30)

Practice of PDCA	Practice levels				X2 Test	P-Value
	Adequate (60%+)		Inadequate (<60%)			
	No	%	No	%		
<b>Age</b>					Fisher	0.36
22+	13	76.5	4	23.5		
<21	9	69.2	4	30.8		
<b>Marital status</b>					Fisher	0.64
Single	8	80	2	20		
Married	16	80	4	20		

Table 3 this table demonstrates that, following program implementation, there is no statistically significant relationship between the practice levels and personal characteristics of nursing interns.

## Discussion

Patient safety goals and principles must be followed by staff nurses in order to increase quality of care and prevent practice errors. (Vaismoradi *et al.*, 2020) [17]. One essential element of high-quality healthcare is patient safety. It's a worldwide task requiring knowledge and skills in several fields, such as systems engineering and human aspects. (Al-Rafay *et al.*, 2018) [2].

In order to reduce risks and errors, it is crucial that nurse interns comprehend and implement the six international patient safety goals. The objectives identify the problematic areas in healthcare and outline the evidence-based, consensus-building solutions to address these issues. The objectives are formatted as standards, with measurable components for

every aim as well as a goal statement. (Joint Commission International, 2011).

One of a nurse's responsibilities is to attain quality, especially in the area of patient safety. The Plan-Do-Check-Act (PDCA) model is a useful tool for quality management that may be used to maximize organizational efficiency and patient outcomes. (Johnson *et al.*, 2016 & Garrett *et al.*, 2017) [7, 6]. The current study aimed to assess the effect of training program regarding the use of PDCA process of quality on nurse interns' practice regarding patient safety goals.

The results of the current study demonstrate that the majority of nurse interns were married, and they were all female. This finding highlights the traditionally feminine aspect of the nursing profession. The current study's findings regarding the attendance of any prior training sessions on patient safety goals showed that none of the study nurse interns had attended any prior training sessions.

This result was in congruence with the previous studies of Al-Rafay *et al.*, (2018) [2]; Shahin, (2019) [15] who found that the majority of nurses were married and female who had not attended any courses or training sessions on patient/client safety objectives. Although this result differs from the conducted study Mohamed *et al.*, (2015) [11]; Abousallah, (2018) [11]; Mohamed, (2018) [10] who mentioned that the majority of the nurse interns were attend a course on patient safety goals.

The results of this study showed that prior to the program's implementation, all nursing interns had an inadequate level of practice regarding applying PDCA to patient safety goals. Although it was unexpected, not all nursing interns were aware of the important approach to quality care in patient safety. The absence of staff development activities to enhance the quality knowledge and abilities of nurse interns, together with the absence of performance indicators, renovation, periodic review, and a documented patient safety plan, as reported by the interns, could be the cause of this. However, following the program's adoption, notable advancements in the nurse administrator's application of supervision were seen, which may have resulted in a notable improvement in nurse-patient safety practices (Kakyo and Xiao, 2019) [9].

This finding was in agreement with the study carried out at ElEbor family health centers by Shaheen *et al.*, (2016) [14] Who found that the highest percentage of nurses had

unacceptable practice with reference to patient/client safety goals. Also, the study of Al-Rafay *et al.*, (2018) <sup>[2]</sup> found that the majority of nurses had unsatisfactory practices when it came to using the PDCA cycle to ensure the safety of their patients or clients.

Following the training program's execution. The study subjects' practice scores are becoming better. The present study's training program includes numerous activities and scenarios aimed at teaching nurse interns how to apply PDCA in patient safety goals, which may explain why the highest percentage of nurse interns had adequate levels of practice in this area. Furthermore, According to the study, this could therefore be related to the nursing manager's responsibility for overseeing personnel, budget, and other resources in order to guarantee patient safety and high quality treatment. Furthermore, it was the duty of those nursing interns to safe work environment.

These results were supported by a study of Wang & Zheng (2016) <sup>[18]</sup> who demonstrate that, following the adoption of PDCA intervention, PDCA intervention group based nursing techniques pass adequate levels after the implementation of PDCA management, whereas prior program implementation, the intervention group pass inadequate levels. Also, the study of Seliem *et al.*, 2018 <sup>[13]</sup> They found that nurses' performance in all PDCA domains related to patient safety goals improved statistically significantly after the intervention was put into place. In the same line the study of Saaid *et al.*, (2020) <sup>[12]</sup> revealed that following the implementation of the PDCA training program, the overall level of nursing practice for the application of international patient safety goals utilizing the (PDCA) model was adequate.

The results of the current study demonstrate that, following the implementation of a training program about the use of the PDCA process of quality, the greatest percentage of nurse interns' practice regarding the application of international patient safety goals using the (PDCA) model was related to reducing patient fall hazards. Oppositely, as the study carried out by Mohamed *et al.*, (2015) <sup>[11]</sup> Researchers revealed that about one-third of health care professionals admitted making a drug mistake. Also, the study of Smith *et al.*, (2015) <sup>[16]</sup>. They stated that the majority of nurses did not perform multifactorial risk assessments or fall-risk assessments on each patient or client activity. Again the study of Al-Rafay *et al.*, (2018) <sup>[2]</sup> revealed that more over half of the nurses used medication control techniques. In the same line the study of Comunale & Sandoval (2018) <sup>[5]</sup> founded that the majority of nurses were not taking precautions to prevent patient or client falls.

The results of this study show that, following program implementation, there was no statistically significant difference between the total mean scores of the practice of nursing interns and their personal and professional qualities. This could be because a variety of factors, rather than just personal and professional traits, affect how nurse interns practice, including conferences, workshops, training courses, and self-learning opportunities.

This result was in disagreement with the study of Brasaité *et al.*, (2016) <sup>[4]</sup> describe health care professionals with more experience in their core specialization were perceived to be more skilled in patient/client safety issues, according to a description of health care professionals' skills regarding patient safety. Also the study of Al-Rafay *et al.*, (2018) <sup>[2]</sup> who found a statistically significant inverse relationship between training and practice for nurses. Again the study of Seliem *et al.*, (2018) <sup>[13]</sup> revealed that the practice scores of the nurses

were negatively correlated with their age and departmental experience.

## Conclusion

Based on the main study's findings, it can be inferred that prior to the training program's introduction, all nursing interns had inadequate levels of practice with patient safety and PDCA. After the training program was implemented, there was a statistically significant improvement in the study subjects' level of practice, with the majority of nurse interns having adequate levels of practice.

## Recommendation

### The study's conclusions lead to the following recommendations being put out

1. Nurse interns' understanding of patient safety objectives has to be updated and expanded through ongoing PDCA inservice training and education programs.
1. The hospital quality unit was required to start providing nursing interns in the various hospital departments with inservice education and training addressing patient safety goals and procedures.
2. Regular meetings are necessary to address potential obstacles to the fulfillment of patient safety goals and find solutions.
3. All nursing interns in the research context should participate in the ongoing training program and development activities about the international patient safety goals, and this program should be expanded to other settings that are comparable.
4. Nursing curricula at King Khalid University's ABHA college of nursing ought to cover the PDCA model and the idea of patient safety management.

## Further research

To obtain results that may be applied to a wider population, it is strongly advised to repeat the study using a bigger probability sample.

It is recommended that more study be done to examine how patient and nursing interns outcomes are affected by multiple PDCA cycles in patient safety.

-Examine the relationship between nurse errors and patient safety goals.

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## References

1. Abousallah A. The impact of application of international safety goals on patient safety culture: A Field study in private hospitals that working in the City of Amman [Dissertation]. Amman: Middle East University, Faculty of Business; c2018.
2. Al-Rafay SS, Shafik SA, Fahem SN. Assessment of nurses' performance regarding international patient safety goals at primary health care settings. IOSR Journal of Nursing and Health Science. 2018;7(6):59-67.
3. Boonyoung N, Yuswardi Y, Thiangchanya P. Head nurses' management regarding patient patient safety and its related factors in public hospitals aceh province, Indonesia [Dissertation]. Songkla: Prince of Songkla University, Faculty of Nursing; c2013.

4. Brasaitė I, Kaunonen M, Martinkėnas A, Mockienė V, Suominen T. Health Care Professionals' Skills Regarding Patient Safety. *Medicina* (Kaunas, Lithuania). 2016;52(4):250-256.
5. Comunale ME, Sandoval M. An assessment of basic patient safety skills in residents entering the first year of clinical training. *Journal of Patient Safety*. 2018;14(2):112-114.
6. Garrett A, Drake S, Holcomb J. Effects of a systematic quality improvement process to decrease complications in trauma patients with pre-hospital peripheral intravenous access. *Journal of Trauma Nursing*. 2017;24(2):236-241.
7. Johnson K, Johnson C, Porter L, Bryant K. Streamlining throughput with the implementation of act Coordinator. *Radiology Management*. 2016;38(1):13-20.
8. Joint Commission International. International Patient Safety Goals: Accreditation Standards for Hospital. In: Joint Commission Resources, Editor. [Cited 2024 Mar 26]. Available from: <http://www.jointcommissioninternational.org>.
9. Kaky TA, Xiao LD. Challenges faced in rural hospitals: The experiences of nurse managers in Uganda. *International Nursing Review*. 2019;66(1):70-77.
10. Mohamed AA. Designing self-learning package for improvement of nurses' knowledge and practice regarding occupational hazard [dissertation]. Zagazig: Zagazig University, Faculty of Nursing; c2018.
11. Mohamed AM, Ali MS, Gewaifel GI. Assessment of patient safety culture in primary healthcare services in Alexandria, Egypt. *Global Journal of Epidemiology and Public Health*. 2015;2:5-14.
12. Saaid BA, Abdalla SM, Abo Elmagd NS. Effect of applying a training program about international patient safety goals on patient's safety culture. *Assiut Scientific Nursing Journal*. 2020;8(22):133-144.
13. Seliem F, Shazly M, Mostafa A. Implementation of (Plan-Do-Check-Act) process of quality and measuring its effect on nurses' practice of patient safety goals. *Egyptian Journal of Health Care*. 2018;10(3):218-233.
14. Shaheen HM, Mahros A, Hegazy NN, Salem SS. Health care providers practice toward patient safety in El-Ebor Family Health Centers Egypt. *Journal of Community Medicine*. 2016;34(4):59-68.
15. Shahin MA. Critical Care Nurses Perceptions about the continuing nursing education at Saudi Hospitals: Educational needs and universities role. *Merit Research Journal of Medicine and Medical Sciences*. 2019;7(4):155-165.
16. Smith ML, Stevens JA, Ehrenreich H, Wilson AD, Schuster RJ, Cherry CB, *et al.* Healthcare providers' perceptions and self-reported fall prevention practices: Findings from a large new york health system. *Frontiers in Public Health*. 2015;3:17.
17. Vaismoradi M, Tella S, Loga PA, Khakurel J, Moreno VF. Nurses' Adherence to patient safety principles: A Systematic Review. *International Journal of Environmental Research and Public Health*. 2020;17(6):20-28.
18. Wang Y, Zheng S. Research on the Application of PDCA Theory in Nursing Quality Management. *Advances in Social Science, Education and Humanities Research*. 2016, 63.
19. Yuswardi Y, Boonyoung N. Patient Safety in Nursing Administration: A literature Review. In: ASEAN/Asian