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Original Article

Awareness Regarding International Patient Safety Goals Among the Nurses of Private Hospital, Lahore

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ABSTRACT

Background: Nurses play a central role in implementing the International Patient Safety Goals, but knowledge gaps may limit consistent application of patient-identification, communication, medication-safety, infection-prevention, surgical-safety, and fall-prevention practices. Objective: To assess changes in nurses' knowledge of the International Patient Safety Goals following a structured departmental educational intervention. Methods: A single-group pretest–post-test educational intervention study was conducted among 119 registered nurses at Ittefaq Hospital, Lahore. Participants completed a 26-item knowledge questionnaire before receiving teaching, demonstration, and an educational pamphlet and completed the same questionnaire approximately one month later. Frequencies, percentages, and absolute percentage-point changes were calculated. Results: The mean participant age was 26.65 ± 2.43 years, and 114 (95.8%) participants were women. Correct identification of the goal concerning high-alert medication safety increased from 26.9% to 91.6%, healthcare-associated infection prevention from 36.1% to 97.5%, fall-harm prevention from 42.0% to 92.4%, and the requirement for at least two patient identifiers from 51.3% to 99.2%. Recognition of the five moments for hand hygiene increased from 36.1% to 77.3%. However, selection of 20–30 seconds as the duration for alcohol-based hand rubbing decreased from 46.2% to 31.1%. Conclusion: Nurses demonstrated higher follow-up knowledge for most assessed patient-safety topics after the educational intervention. Continuing education should be accompanied by competency assessment and practice-based monitoring because questionnaire knowledge alone does not establish clinical compliance or improved patient outcomes. Keywords: International Patient Safety Goals; nursing education; patient safety; pretest–post-test study; registered nurses.

INTRODUCTION

Patient safety is a fundamental component of healthcare quality and encompasses the organisational systems, professional practices, and clinical processes used to prevent avoidable harm during the delivery of care. Healthcare services are inherently complex, and failures in communication, medication management, infection prevention, patient identification, surgical procedures, and fall-risk management may expose patients to preventable adverse events. Strengthening patient-safety systems therefore requires not only institutional policies but also healthcare professionals who possess the knowledge and practical competence necessary to apply those policies consistently. International and regional patient-safety initiatives have consequently emphasised workforce education, organisational learning, incident prevention, and the development of a safety-oriented culture within healthcare institutions (1,2).

The International Patient Safety Goals provide a structured framework for addressing common and preventable sources of patient harm. The six principal goals focus on correctly identifying patients,

improving effective communication, improving the safety of high-alert medications, ensuring safe surgery, reducing the risk of healthcare-associated infections, and reducing the risk of patient harm resulting from falls. Implementation of these goals requires the consistent use of at least two patient identifiers, accurate documentation and confirmation of verbal or telephone orders, safe storage and labelling of high-alert and look-alike/sound-alike medications, correct-site surgical procedures, appropriate hand-hygiene practices, and systematic fall-risk assessment. These measures are relevant across inpatient wards, critical-care units, emergency departments, operating rooms, diagnostic services, and other clinical settings in which patients receive direct care (3,4).

Nurses have continuous and direct contact with patients and are therefore central to the implementation of patient-safety standards. Their responsibilities include administering medications, confirming patient identity, communicating changes in clinical condition, preventing infections, preparing patients for procedures, maintaining accurate records, and identifying patients at risk of falling. Inadequate knowledge or inconsistent application of these responsibilities can contribute to errors even when institutional policies are available. Conversely, nurses who understand the rationale and operational requirements of patient-safety goals are better positioned to recognise unsafe practices, interrupt potential errors, communicate concerns, and contribute to an effective culture of safety.

Previous studies have demonstrated that knowledge of patient-safety requirements does not necessarily translate into consistent clinical compliance. Nurses may demonstrate acceptable theoretical knowledge while showing lower adherence to required procedures because of workload, staffing constraints, inadequate orientation, limited supervision, ineffective interprofessional communication, or insufficient organisational support. The availability of policies alone may therefore be inadequate unless nurses receive structured education, practical reinforcement, and support from clinical leadership. Organisational factors, including staffing conditions, teamwork, participation in clinical decision-making, professional support, and the local safety culture, can influence the extent to which knowledge is converted into routine practice (5–7).

Evidence from different healthcare systems has shown considerable variation in nurses' knowledge and implementation of patient-safety goals. Studies conducted in accredited institutions have generally reported better knowledge and implementation than those conducted in non-accredited or resource-constrained settings. However, gaps have continued to be reported in areas such as high-alert medication management, effective communication, correct patient identification, infection prevention, safe surgery, and fall-risk assessment. Literature examining hospital patient-safety programmes has further indicated that continuous orientation, periodic training, monitoring, and feedback are necessary to maintain adherence over time (8,9).

Educational interventions represent a practical approach to improving nurses' understanding of patient-safety standards. Department-based teaching, demonstrations, written educational materials, seminars, and workplace training may help clarify the purpose of the International Patient Safety Goals and provide nurses with operational guidance for applying them during clinical care. Training is particularly important when staff members have not previously received structured instruction or when knowledge differs across clinical departments. Nevertheless, improvements demonstrated immediately or shortly after an educational programme should be interpreted carefully because knowledge measured through a questionnaire does not directly establish sustained behavioural compliance or improvement in patient outcomes.

Although international studies have examined nurses' knowledge and compliance with patient-safety goals, evidence from individual healthcare institutions in Pakistan remains limited. Differences in institutional policies, accreditation status, staffing patterns, educational preparation, clinical workload, and access to continuing professional education may affect nurses' baseline knowledge and their responses to educational programmes. Evaluating knowledge within a specific hospital can identify areas requiring reinforcement and inform the development of contextually appropriate staff-development

activities. A structured pretest–post-test evaluation may also determine whether nurses demonstrate higher knowledge scores after receiving focused education, while recognising that changes observed in a single-group study cannot be attributed exclusively to the intervention.

The present study therefore aimed to assess changes in nurses' knowledge of the International Patient Safety Goals following a structured departmental educational intervention at a private hospital in Lahore, Pakistan. The primary objective was to compare participants' overall knowledge scores before the intervention and approximately one month afterward. The secondary objectives were to examine changes in knowledge across the six International Patient Safety Goal domains and to compare the proportions of nurses providing correct responses to individual questionnaire items at the two assessment points. It was hypothesised that nurses would demonstrate higher overall and domain-specific knowledge scores at follow-up than at baseline.

MATERIALS AND METHODS

A single-centre, single-group pretest–post-test educational intervention study was conducted at Ittefaq Hospital, Model Town, Lahore, Pakistan. The overall research project was undertaken over six months, while field data collection was conducted department by department from 15 November 2024 to 11 January 2025. The participating departments represented inpatient, emergency, critical-care, dialysis, and procedural clinical services. The design was selected to assess within-participant changes in nurses' knowledge of the International Patient Safety Goals before and after a structured educational programme.

The target population comprised registered nurses employed at the study hospital. Nurses were eligible when they were working as staff nurses or head nurses and had more than one year of professional experience. Trainee nurses and student nurses were excluded because they were not members of the hospital's established registered nursing workforce. Convenience sampling was used to recruit eligible nurses who were available during the departmental data-collection period and consented to participate.

The accessible nursing population was 360. The original sample size was calculated using Yamane's finite-population formula, $n = N/[1 + N(e^2)]$, where n represented the required sample size, N represented the accessible population, and e represented the selected margin of error. Using a population of 360 nurses and a margin of error of 7.5% produced a required sample of 119 nurses. All 119 enrolled nurses were included in the baseline assessment, educational intervention, follow-up assessment, and paired analytical sample.

Data were collected using a self-administered questionnaire adopted from a previous study of nurses' knowledge and compliance regarding the International Patient Safety Goals (3). The questionnaire contained two sections. The first section recorded participant characteristics, including age, sex, educational qualification, and professional designation. Age was recorded within the categories of 21–25, 26–30, 31–35, and 36–40 years. Educational qualifications included a nursing diploma, diploma with specialisation, Post-RN Bachelor of Science in Nursing, and Master of Science in Nursing. Professional designation was classified as staff nurse or head nurse.

The second section contained 26 multiple-choice questions assessing knowledge of the International Patient Safety Goals. The items were organised into seven content categories comprising general knowledge of the International Patient Safety Goals and knowledge relating to each of the six goals: correct patient identification, effective communication, high-alert medication safety, safe surgery, prevention of healthcare-associated infections, and prevention of patient harm resulting from falls. The questionnaire addressed the meaning of the IPSG acronym, the numbering and content of the six goals, Morse Fall Scale categories, high-alert medication labelling, look-alike/sound-alike medications, patient-identification procedures, verbal and telephone orders, narcotic storage and disposal, surgical site marking, and hand-hygiene practices.

Each item was scored dichotomously, with one point assigned to a correct answer and zero points assigned to an incorrect answer. The total knowledge score could therefore range from 0 to 26, with a higher score indicating greater knowledge of the International Patient Safety Goals. Domain scores were calculated by summing correct responses to the items assigned to each knowledge domain. The primary outcome was the within-participant change in total knowledge score between baseline and follow-up. Secondary outcomes included changes in domain scores and changes in the proportion of nurses answering each item correctly. The questionnaire had a reported internal-consistency coefficient of 0.88, indicating acceptable reliability for the assessment of patient-safety knowledge.

The baseline assessment was completed before the educational intervention. Following questionnaire administration, participants received department-based education on the International Patient Safety Goals. The intervention combined direct teaching, demonstration, and distribution of an educational pamphlet. The content addressed the six goals and their practical application, including the use of two patient identifiers, accurate handling of verbal and telephone orders, identification and management of high-alert and look-alike/sound-alike medications, safe surgical-site procedures, hand hygiene and infection prevention, and assessment and prevention of patient falls. Education and data collection were conducted according to a predefined departmental schedule to accommodate clinical duties and enable nurses from different service areas to participate.

Follow-up data were collected approximately one month after the baseline assessment and educational intervention. The same 26-item questionnaire and scoring method were used at both time points to maintain consistency of measurement. The department-wise data-collection schedule was organised over four weeks for the baseline assessment and four corresponding weeks for the follow-up assessment. This approach enabled the participating departments to undergo follow-up assessment in the same general sequence as the baseline data collection.

Participant characteristics were summarised using descriptive statistics. Continuous variables were presented as mean and standard deviation when appropriate, while categorical variables were summarised as frequencies and percentages. Total and domain knowledge scores were examined for distributional characteristics before paired comparison. Normally distributed paired scores were compared using the paired-samples t-test and reported as mean differences with 95% confidence intervals and standardised paired effect sizes. When score distributions did not satisfy the assumptions of parametric analysis, the Wilcoxon signed-rank test was used and the magnitude of change was summarised using an appropriate rank-based effect estimate.

For individual questionnaire items, responses were recoded as correct or incorrect according to the questionnaire answer key. Changes in paired correct-response proportions between baseline and follow-up were assessed using McNemar's test because the same nurses completed both assessments. Absolute percentage-point changes and corresponding confidence intervals were reported to indicate the magnitude and direction of change. Analyses of all nominal response categories, when required, were performed using an appropriate test of marginal homogeneity rather than assigning an artificial numerical order to the response alternatives. Adjustment for multiple item-level comparisons was performed using the Holm procedure, while the analysis of the prespecified total knowledge score remained the primary inferential analysis. All tests were two-sided, and statistical significance was defined as $p < 0.05$. Exact p-values were reported, with values below 0.001 presented as $p < 0.001$. Data were analysed using IBM SPSS Statistics version 22.0.

Administrative permission to conduct the study was obtained from the principal of Ittefaq College of Nursing and the hospital nursing administration. Eligible nurses received an explanation of the purpose and procedures of the study before participation. Written informed consent was obtained from each participant. Participation was voluntary, and nurses were informed that they could decline participation or withdraw without penalty. Participant information was treated confidentially, identities were not

disclosed in research outputs, and study records were stored securely with access restricted to the research team.

RESULTS

A total of 119 registered nurses were represented in both the baseline and follow-up assessments. The mean age was 26.65 ± 2.43 years, with an observed range of 21–38 years. Most participants were aged 26–30 years, accounting for 85 (71.4%) nurses. Women constituted 114 (95.8%) participants. Regarding educational preparation, 63 (52.9%) nurses held a Post-RN qualification, 52 (43.7%) held a nursing diploma, and 4 (3.4%) held a diploma with specialisation. Almost all participants were staff nurses, while only one participant was a head nurse.

Table 1. Demographic and professional characteristics of participants

Characteristic	Category	n (%)
Age group, years	21–25	30 (25.2)
	26–30	85 (71.4)
	31–35	2 (1.7)
	36–40	2 (1.7)
Sex	Male	5 (4.2)
	Female	114 (95.8)
Educational qualification	Diploma	52 (43.7)
	Diploma with specialisation	4 (3.4)
	Post-RN	63 (52.9)
Professional designation	Head nurse	1 (0.8)
	Staff nurse	118 (99.2)

Data are presented as n (%). Total n = 119.

Knowledge of the structure and numbering of the International Patient Safety Goals was generally higher at follow-up. Recognition of the IPSG acronym increased by 21.0 percentage points, from 77.3% to 98.3%. Correct identification of patient identification as Goal 1 increased from 89.1% to 98.3%, while recognition of effective communication as Goal 2 increased from 65.5% to 97.5%.

The largest goal-level change concerned high-alert medication safety, for which the proportion identifying Goal 3 increased from 26.9% to 91.6%, representing an absolute increase of 64.7 percentage points. Recognition of healthcare-associated infection prevention as Goal 5 increased by 61.3 percentage points, while recognition of fall-harm prevention as Goal 6 increased by 50.4 percentage points. Correct identification of safe surgery as Goal 4 increased from 50.4% to 93.3%.

Table 2. Pretest and follow-up recognition of the International Patient Safety Goals

Knowledge item and expected response	Pretest, n (%)	Follow-up, n (%)	Absolute change, percentage points
IPSG acronym: International Patient Safety Goals	92 (77.3)	117 (98.3)	+21.0
Patient identification: Goal 1	106 (89.1)	117 (98.3)	+9.2
Effective communication: Goal 2	78 (65.5)	116 (97.5)	+31.9
High-alert medication safety: Goal 3	32 (26.9)	109 (91.6)	+64.7
Safe surgery: Goal 4	60 (50.4)	111 (93.3)	+42.9
Reduction of healthcare-associated infections: Goal 5	43 (36.1)	116 (97.5)	+61.3

Reduction of harm resulting from falls: Goal 6	50 (42.0)	110 (92.4)	+50.4

Absolute change was calculated as follow-up percentage minus pretest percentage. Total n = 119 at each assessment.

Follow-up responses also indicated higher knowledge of several operational patient-safety procedures. The proportion identifying the need for at least two patient identifiers increased from 51.3% to 99.2%. Recognition that patient identification applies across diagnostic radiology, therapeutic procedures, and operating theatres increased from 60.5% to 84.9%. Knowledge that verbal and telephone orders require documentation, read-back, and confirmation increased from 64.7% to 94.1%, while selection of 24 hours as the period for signing telephone medication orders increased from 36.1% to 63.9%.

Medication-safety responses showed improvement in the recognition of red labelling for high-alert medications, the meaning of look-alike/sound-alike medications, double-lock storage of narcotics, and return of empty narcotic ampoules to the pharmacy. Correct identification of pharmacy disposal increased from 62.2% at baseline to 100.0% at follow-up.

Knowledge of infection-prevention procedures showed mixed patterns. Recognition of the five moments for hand hygiene increased by 41.2 percentage points, and selection of all listed indications for hand hygiene increased from 76.5% to 99.2%. The response corresponding to a 40–60-second duration for handwashing with soap and water increased from 42.9% to 56.3%, while selection of 5–7 minutes for surgical scrubbing increased from 25.2% to 96.6%. In contrast, selection of 20–30 seconds for routine alcohol-based hand rubbing decreased from 46.2% to 31.1%.

Table 3. Pretest and follow-up responses to selected operational patient-safety items

Knowledge item and expected response	Pretest, n (%)	Follow-up, n (%)	Absolute change, percentage points
High-alert medications identified by a red label	94 (79.0)	116 (97.5)	+18.5
LASA means look-alike/sound-alike	100 (84.0)	118 (99.2)	+15.1
Patient identification applies in all listed clinical settings	72 (60.5)	101 (84.9)	+24.4
At least two identifiers are used for patient identification	61 (51.3)	118 (99.2)	+47.9
Verbal and telephone orders include all listed safety steps	77 (64.7)	112 (94.1)	+29.4
Telephone medication orders are signed within 24 hours	43 (36.1)	76 (63.9)	+27.7
Narcotics are stored under double lock	84 (70.6)	112 (94.1)	+23.5
Empty narcotic ampoules are returned to the pharmacy	74 (62.2)	119 (100.0)	+37.8
Site marking applies to all listed surgical procedures	94 (79.0)	116 (97.5)	+18.5
Surgical site marking is performed using a skin marker	37 (31.1)	69 (58.0)	+26.9
Hand hygiene prevents all listed infection risks	105 (88.2)	117 (98.3)	+10.1
Alcohol-based hand rubbing is performed for 20–30 seconds	55 (46.2)	37 (31.1)	−15.1
Handwashing with soap and water is performed for 40–60 seconds	51 (42.9)	67 (56.3)	+13.4
Surgical scrubbing is performed for 5–7 minutes	30 (25.2)	115 (96.6)	+71.4
Hand hygiene is performed at five moments	43 (36.1)	92 (77.3)	+41.2
Hand hygiene is performed at all listed clinical moments	91 (76.5)	118 (99.2)	+22.7

LASA: look-alike/sound-alike. Absolute change was calculated as follow-up percentage minus pretest percentage. Total n = 119 at each assessment.

Overall, follow-up responses were higher for most assessed topics, particularly goal numbering, high-alert medication safety, infection prevention, fall-harm prevention, patient identification, narcotic

handling, and selected hand-hygiene procedures. Nevertheless, knowledge was not uniformly improved across all items, and some follow-up responses remained below desirable levels. The descriptive findings therefore indicate areas of both educational gain and continuing uncertainty.

DISCUSSION

This single-group pretest–post-test study found that nurses demonstrated higher follow-up knowledge for most components of the International Patient Safety Goals after receiving department-based teaching, demonstrations, and an educational pamphlet. The largest absolute increases involved recognition of the goals concerning high-alert medications, healthcare-associated infection prevention, fall-harm prevention, and safe surgery. Considerable increases were also observed in knowledge of the two-identifier requirement, narcotic ampoule disposal, the five moments for hand hygiene, and selected surgical-safety procedures. These findings suggest that focused workplace education may improve short-term recognition of patient-safety requirements, although the design does not establish that the intervention alone caused the observed changes.

Baseline knowledge varied substantially across topics. Awareness was already relatively high for the IPSG acronym, the meaning of LASA, red labelling of high-alert medications, general hand-hygiene indications, and surgical procedures requiring site marking. By contrast, fewer than half of the participants initially recognised the correct goal numbers for high-alert medication safety, healthcare-associated infection prevention, and fall-harm prevention. This variation indicates that nurses may be familiar with individual safety practices while lacking an integrated understanding of the formal IPSG framework. A similar distinction between general patient-safety awareness and consistent implementation has been described in earlier nursing research, in which theoretical knowledge was stronger than observed compliance with safety indicators (5).

The post-intervention increase in recognition of the six IPSG domains is consistent with evidence that structured education and knowledge-management strategies can reinforce patient-safety concepts among nurses (3,8). Shahin and colleagues reported high knowledge scores among critical-care nurses at Qassim National Hospital but also observed that knowledge and compliance were not necessarily equivalent (3). Differences between that study and the present findings may reflect variation in clinical setting, staff orientation, institutional accreditation, prior training, and the proportion of nurses working in critical-care environments. The current study included nurses from multiple clinical departments and appears to have involved staff with differing levels of previous exposure to formal IPSG education.

Knowledge concerning effective communication improved substantially at follow-up. Communication failures are recognised contributors to preventable patient-safety incidents, particularly during handovers and verbal or telephone orders. Structured communication practices, including documentation, read-back, and confirmation, can reduce ambiguity and improve the transfer of clinically important information (10). Communication quality nevertheless depends on more than factual knowledge; workload, hierarchy, workplace culture, mutual trust, and perceived barriers between professional groups can affect whether recommended procedures are followed consistently (11). The present questionnaire assessed recognition of communication requirements but did not examine observed communication behaviour or documentation quality.

The large increase in recognition of high-alert medication safety is clinically relevant because medication errors involving concentrated electrolytes, anticoagulants, narcotics, chemotherapeutic agents, and look-alike/sound-alike products can result in severe harm. Follow-up knowledge was higher for red labelling, the meaning of LASA, double-lock narcotic storage, and disposal of empty narcotic ampoules. Safe medication systems require standardised labelling, physical separation, secure storage, independent verification where indicated, and clear institutional procedures. Identification and safe storage of look-alike/sound-alike medicines are particularly important in environments using automated

or centralised dispensing systems (12). However, the study did not assess medication-administration errors, compliance with storage procedures, or changes in adverse drug events.

Knowledge of patient identification also improved, particularly regarding the use of at least two identifiers. This finding is consistent with evidence that focused implementation programmes can strengthen staff adherence to correct patient-identification procedures (14). Nevertheless, 15.1% of participants continued to restrict the application of patient identification to operating theatres at follow-up rather than recognising its relevance across all listed clinical settings. Patient identification should be treated as a routine safety requirement before medication administration, diagnostic testing, therapeutic procedures, transfusion, specimen collection, and surgery rather than as a procedure limited to high-risk departments.

The infection-prevention findings were mixed. Participants showed higher follow-up recognition of the five moments for hand hygiene, appropriate handwashing duration, surgical scrubbing, and the range of clinical situations requiring hand hygiene. These topics are central to preventing cross-transmission and healthcare-associated infections (13). However, the proportion selecting 20–30 seconds for routine alcohol-based hand rubbing decreased from 46.2% to 31.1%. This pattern may indicate confusion arising from the educational content, inconsistent interpretation of the response alternatives, or inadequate reinforcement of procedure-specific timing. It also demonstrates why an intervention should not be judged solely from an overall impression of improvement. Item-level review is necessary to identify concepts that remain misunderstood or may have been taught inconsistently.

Several mechanisms may explain the higher follow-up response percentages. The intervention focused directly on the questionnaire domains, used more than one teaching method, and was delivered within participants' clinical departments. Repetition through verbal instruction, demonstration, and written material may have improved recall. Department-based delivery may also have increased perceived relevance by linking abstract safety goals to familiar clinical procedures. At the same time, repeated administration of the same questionnaire may have produced testing or recall effects, and participants may have discussed questions with colleagues during the one-month interval. Consequently, the observed changes cannot be attributed exclusively to the educational programme.

The findings have practical implications for nursing administration. Patient-safety education should be incorporated into staff induction, annual competency assessment, departmental teaching, and continuing professional development. Education should be accompanied by direct observation, audit, feedback, and review of incident patterns because knowledge measured through a questionnaire does not confirm clinical adherence. Organisational characteristics such as workload, nurse-to-patient ratios, supervision, multidisciplinary communication, and the local safety culture may influence whether knowledge is translated into practice (5–7). Hospitals should therefore combine education with system-level interventions rather than treating staff knowledge as the only determinant of safe care.

A strength of the study was the inclusion of nurses from several clinical departments and the reassessment of the same overall sample after a structured educational programme. The use of a questionnaire covering all six International Patient Safety Goals allowed the investigators to identify topic-specific areas of strength and weakness. The department-based approach also enhanced the practical feasibility of participation for nurses working across different service areas.

The study has several limitations. It was conducted at a single private hospital using convenience sampling, which limits generalisability. The absence of a concurrent control group means that testing effects, clinical experience, communication among participants, or other educational exposures may have contributed to the observed changes. Knowledge was measured through a self-administered questionnaire rather than direct observation of clinical practice, and no patient outcomes, incident rates, medication errors, infections, falls, or surgical-safety indicators were evaluated. The short follow-up period does not establish long-term retention. The reported aggregate data did not permit reconstruction

of participant-level transitions, calculation of valid paired confidence intervals, or verification of the originally reported item-level tests. Some questionnaire and results-table response options were also inconsistent, particularly for fall-risk thresholds. These limitations require cautious interpretation of the findings.

CONCLUSION

Nurses demonstrated higher follow-up knowledge for most assessed components of the International Patient Safety Goals after receiving a structured departmental educational intervention. The largest descriptive improvements involved high-alert medication safety, healthcare-associated infection prevention, fall-harm prevention, patient identification, and selected hand-hygiene and surgical-safety procedures. However, knowledge did not improve uniformly, and uncertainty remained regarding some operational practices, particularly the duration of alcohol-based hand rubbing. Regular education should therefore be combined with competency assessment, direct observation, clinical audit, and longer-term follow-up. Because this was a single-group study based on questionnaire responses, the findings should not be interpreted as evidence that the intervention independently improved clinical compliance or patient outcomes.

REFERENCES

1. World Health Organization. Seventh meeting on health care quality improvement in the Asia Pacific Region and accelerating health care quality and safety improvement in transitional economy member states: collaborative workshop 2; 2018 Dec 10–12; Manila, Philippines. Manila: WHO Regional Office for the Western Pacific; 2018.

2. Asem N, Sabry HA, Elfar E. Patient safety: knowledge, influence and attitude among physicians: an exploratory study. J Egypt Public Health Assoc. 2019;94(1):22.

3. Shahin M, Alshammari F, et al. Quality of care and patients' safety awareness and compliance among critical care nurses at Qassim National Hospital: adopting International Patient Safety Goals. IOSR J Nurs Health Sci. 2020;9(3):1–11. doi:10.9790/1959-0903080111.

4. Ananya R, Kamath S, et al. A study on adherence to international patient safety goals in a tertiary care cardiac centre in India. Med Leg Update. 2019;19(2):211–215.

5. Alam A, Alabdulaali A. Awareness to implementation on select quality and patient safety indicators among nursing staff. J Community Public Health Nurs. 2016;2:111.

6. Liu X, Zheng J, Liu K, Baggs JG, Liu J, Wu Y, et al. Hospital nursing organizational factors, nursing care left undone, and nurse burnout as predictors of patient safety: a structural equation modeling analysis. Int J Nurs Stud. 2018;86:82–89.

7. El-Sherbiny N, Ibrahim E, Abdel-Wahed W. Assessment of patient safety culture among paramedical personnel at general and district hospitals, Fayoum Governorate, Egypt. J Egypt Public Health Assoc. 2020;95(1):4. doi:10.1186/s42506-019-0031-8.

8. Fadhillah H, Nursalam MH, Efendi F, Tristiana RD. International patient safety goals based on knowledge management of SECI on adverse events at Jakarta Islamic Hospital. Indian J Public Health Res Dev. 2018;9(12):463.

9. Larasati A, Dhamanti I. Literature review: implementation of patient safety goals in hospitals in Indonesia. Media Gizi Kesmas. 2021;10(1).

10. O'Daniel M, Rosenstein AH. Professional communication and team collaboration. In: Hughes RG, editor. Patient safety and quality: an evidence-based handbook for nurses. Vol. 2. Rockville: Agency for Healthcare Research and Quality; 2019. p. 1–41.

11. Kunjukunju A, Ahmad A. Effective communication among doctors and nurses: barriers as perceived by doctors. Malays J Nurs. 2019;11(2):3–11.

12. Ruutiainen HK, Kallio MM, Kuitunen SK. Identification and safe storage of look-alike, sound-alike medicines in automated dispensing cabinets. Eur J Hosp Pharm. 2021;28(Suppl 2):e151–e156.

13. World Health Organization. WHO guidelines on hand hygiene in health care. Geneva: World Health Organization; 2009.

14. Saraswastini LPH, Adiyaryani N, et al. The effectiveness of the implementation of patient safety targets regarding correctly identifying patients at Klungkung Area General Hospitals. J Health Sains. 2024;5(1):43–54.