# Assessment of Staff Nurses' Performance Related to Patient Safety goals

**Mohammed Mohammed Hamed[1], Samah Faisal Fakhry[2], Nema Fathy Saad [3]**

**(1)** Master's degree in Nursing administration, **(2)** Professor of Nursing Administration, **(3)** Assistant Professor of Nursing Administration-Nursing Administration Department Faculty of Nursing Ain Shams University

**abstract**

**Background**: Patient safety is a discipline in the healthcare sector that applies safety science methods toward the goal of achieving a trustworthy system of healthcare delivery. **Aim of the study**: to assess staff nurses' performance related to international patient safety goals (IPSGs). **Subjects and Methods**: The study was conducted in medical wards and critical care units of Ain Shams University Hospital. **Research design:** a descriptive design was used. It included 116 staff nurses. Data were collected using a self-administered questionnaire for knowledge and an observation checklist for practice. **Results**: Slightly more than one-third of staff nurses had satisfactory knowledge, with no significant difference, only four (3.4%) of the staff nurses had an adequate total practice of IPSGs, with no statistically significant difference **Conclusion and Recommendations**: knowledge and practices of staff nurses related to patient safety need to be improved. The study recommends intensive training in IPSGs for staff nurses using the" training approach, with periodic refreshing through workshops. Their practices should be closely supervised. Future research on the impact of staff nurses' training in IPSGs on patients' safety indicators.

**Keywords**: IPSGs, staff nurse, Performance.

## Introduction

According to the World Health Organization, patient safety (PS) is about preventing medical errors and their adverse effects on patients during healthcare delivery ***(Azyabi et al., 2021)***. Unsafe medical practices can lead to patient injury, death, or disability ***(Gurková et al., 2019)***. It is estimated that approximately 400,000 annual deaths are related to preventable harms ***(Amiri et al., 2018)***.

Although estimates of the size of the problem are imprecise, it is likely that millions of people suffer from disabling injuries or death as a consequence of clinical risk and safety incidents ***(Farokhzadian et al., 2018)***. The proliferation of such incidents has led to the recognition of the need to improve patient safety culture in the healthcare industry worldwide. Furthermore, patient safety has been considered one of the strategic components of healthcare management ***(Aveling et al., 2016)***.

Poor communication and collaboration, lack of knowledge, and inadequate training were among the main causes of nursing errors in hospitals. Studies have shown the lack of communication skills in nurses and nursing students. Hence, a training program for nurses on patient safety alongside strategies to improve professional communication is required to improve patient safety ***(Amiri et al., 2018)***.

In order to be prepared to face the complexities and challenges of medical care, nurses should be trained to be collaborative, practice-ready professionals, capable of working in interprofessional teams in order to improve the quality of medical care, and ensure patient safety ***(Huang and Wang, 2020)***. In the clinical situation, hospital care is filled with high-stress, quickly changing scenarios; nurses and other healthcare providers are expected to have competencies involving not just their own professional skills, but also the capability of using their skills as part of larger medical teams ***(Campo et al., 2018)***.

For nursing professionals, in particular, there is an expectation that they will be proficient in core nursing competencies for patient safety. As patient safety is the primary

concern, it is too risky to carry out experiential-learning activities through clinical practice at real clinical sites. Nurses, lacking clinical experience and critical-thinking skills, are especially error-prone. To prevent such medical errors in a clinical setting, the most effective strategy is to incorporate situational, scenario-driven training exercises into professional training ***(Lewis et al., 2019)***.

The international literature has indicated that the specialized training of healthcare professionals is an important resource for the health system, with a positive impact on professional values, patient outcomes, and on the promotion of evidence-based practices ***(Cosentino et al., 2020)***.

**Significance of the study:**

Since patient safety is still an ongoing and critical challenge for the national health service, it is deemed important to focus on how education and training interventions can improve nurses' related performance.

The most important challenge in the field of patient safety must be how to prevent harm during the health care process, or how to reduce the risk of "unnecessary" harm to an acceptable minimum.

**Aim of the study**

This study aims to assess staff nurses' performance related to international patient safety goals (IPSGs).

**Research question:**

What is the staff nurses' knowledge related to patient safety goals?

What is the staff nurses' practice related to patient safety goals?

**Research design**:

A descriptive, design was followed in carrying out this study.

**Setting:**

The study was conducted in the medical wards and critical care units of Ain Shams University Hospital. It is affiliated to Ain shams University Hospitals. The hospital has 835 bed-capacity. It provides general and medical services in various specialties including endocrinology, immunology, allergic diseases, tropical medicine, chest diseases, geriatric care, and intensive care services.

**Subjects of the study:**

The study subjects consisted of 116 staff nurses.

**Sampling**

The sample size was calculated to detect an improvement in the proportions of nurses having satisfactory knowledge or adequate practice with a moderate effect size (0.4) based on an expected Odds Ratio of 2.2 calculated according to ***Chinn (2000)***, with a baseline of 50% at 95% level of confidence and 80% power. Using the Open-Epi software package. the required sample size was 116 subjects.

**Tools of data collection:**

The data for this study were collected using two tools, namely a self-administered questionnaire and an observation checklist.

1- Patient safety knowledge questionnaire: This tool consisted of two parts:

**Part I:** This was intended to collect data related to the demographic characteristics of the staff nurses such as age, gender, qualification, marital status, and previous attendance of related training courses. It also had some identification data such as the unit, group, and time.

**Part II:** This part was for the assessment of staff nurses' knowledge related to patient safety goals. It consists of 16 "True/False" questions and 20 "MCQ" questions covering various aspects of the patient safety concept and each of the six patient safety goals (IPSGs).

- **Scoring system:**

For each question, a correct response was scored 1 and an incorrect zero. For each area of knowledge and for the total questionnaire, the scores of the items were summed-up and the total divided by the corresponding number of items

giving a mean score for the part and for the total. These scores are converted into percent scores. Knowledge was considered satisfactory if the percent score was 60% or more and unsatisfactory if less than 60%.

**2- Observation checklist for practice**

This tool was used to assess staff nurses' practice of patient safety goals. It was adapted from ***Abdelhameed (2018)*** and modified by the researcher. The tool consists of two parts

**Part I**: This was for identification data such as name and serial number, date, day of observation, unit, group, and time.

**Part II**: This part was a checklist covering all parameters of the patient safety goals. It included the steps of patient safety goals and procedures to be performed by the staff nurse.

❖ **Scoring system:**

The items observed to be "not done" and "done" were scored "0" and "1" respectively. The "not applicable" items were not scored and were discounted from the totals. For each goal and sub-goal and for the total checklist, the scores of the items are summed-up and the totals are divided by the number of corresponding items, giving mean scores. These were converted into percent scores. The performance was considered adequate if the percent score was 85% or higher and inadequate if less than 85%.

**Operational Design:**

The operational design involves a description of the study preparatory phase, pilot study, and fieldwork.

**A- Preparatory phase:**

The researcher conducted a thorough review of the pertinent current and past available literature covering the various aspects of the study variables. This was achieved using textbooks, and published articles in scientific peer-reviewed journals as well as internet search. This was necessary to get acquainted with the various aspects of the research topics and as well to assist in the selection and preparation of the data collection tools.

**Tools validity and reliability**:

Once prepared in their preliminary form, the data collection tools were presented to a panel of experts in nursing administration from two universities: three professors from Ain Shams University and two professors from Cairo University. They reviewed their clarity, relevance, logical sequence, and comprehensiveness for face and content validation. The tools were modified based on their comments and suggestions. These were mainly in the form of rewording or rephrasing a few items.

The reliability of the tools was ascertained by assessing their internal consistency. They demonstrated a good level of reliability with Guttman split-half Coefficients of 0.948 for the patient safety knowledge tool and 0.859 for the observation checklist

**B- Pilot Study**

A pilot study was carried out after the development of the tools and before starting the actual data collection. The pilot study's aim was to ensure the clarity, understandability, and feasibility of the tool and to estimate the time required for data collection. It was carried out on a sample representing 10% of the main study sample. Based on the pilot study results, necessary modifications were done in the form of rewording and rephrasing some items. These participants were not included in the main study sample.

**C. Fieldwork:**

The fieldwork of the study was performed in the period from the beginning of October 2019 and was completed by December 2019. The researcher went three days per week (Sunday, Tuesday, and Thursday). This included the assessment, planning, implementation, and evaluation phases.

Assessment phase: This phase entailed gathering pre-program data for baseline assessment The researcher explained to the participants the

questionnaire sheets. The researcher distributed data collection tools to the respondents individually in the unit. The time needed to complete the data collection forms approximately ranged from 25 – 30 minutes for each nurse. The researcher was present during this time to clarify any inquiries. Each participant filled out the tools and back them to the researcher to check for completeness. The observation checklist was completed by the researcher while nurses are working.

**Ethical consideration:**

Prior to study conduction, approval of the study protocol was obtained from the Scientific Research Ethics Committee at the Faculty of Nursing, Ain Shams University. In addition, the researcher met with the medical and nursing directors of the hospital and explained the aim of the study to gain their approval. Each staff nurse provided verbal informed consent to participate after being briefed about the study's aim and procedures. They were informed about their rights to refuse participation or to withdraw from the study at any time. The anonymity and confidentiality of any obtained information were guaranteed.

**Administrative design:**

An official letter requesting permission to conduct the study was directed from the Dean of the Faculty of Nursing, Ain Shams University to the hospital medical and nursing directors to obtain their approval to conduct the study. The letter included the aim of the study and a photocopy of the data collection forms to get permission and help for the collection of the data.

**IV- Statistical design:**

Data entry and statistical analysis were done using SPSS 20.0 statistical software package. Data were presented using descriptive statistics in the form of frequencies and percentages for qualitative variables, means and standard deviations, and medians for quantitative variables. Gutmann Split-half coefficient was calculated to assess the reliability of the tools through their internal consistency. Qualitative categorical variables were compared using the chi-square test. Spearman rank correlation was used for the assessment of the inter-relationships among quantitative variables and ranked ones. To identify the independent predictors of the knowledge and practice scores, multiple linear regression analysis was used and an analysis of variance for the full regression models was done. Statistical significance was considered at a p-value $<0.05$.

**Results:**

**Table (1):** shows that more than two-thirds of the study sample were females. The highest percentage of them were having a bachelor's degree. Their medians of experience years were 7.0.

**Table (2):** indicates that staff nurses' knowledge of IPSGs were unsatisfactory in relation to safety aims, goals I, III & V ( 42.2 %, 46.4 %, 58.6 % & 45.7 %) respectively. The staff nurses' knowledge of IPSGs were satisfactory in relation to goals II, IV & VI ( 71.6 %, 72.4 % & 68.1 %) respectively.

**Figure (1):**As displays, only slightly more than one-third of the staff nurses were having satisfactory total knowledge, and more than two third had unsatisfactory.

**Table (3):**Overall, illustrates a very low practice of all IPSGs for staff nurses. The only exception was regarding hand hygiene in Goal IV. No differences of statistical significance could be revealed.

**Figure (2):**As displayed in, only four (3.4%) of the staff nurses had an adequate total practice of IPSGs, with no statistically significant difference.

**Table (1):** Demographic Characteristics of Staff Nurses in the Study.

| | Group (n=116) | |
|---|---|---|
| | No. | % |
| **Age**: | | |
| <30 | 56 | 48.3 |
| 30+ | 60 | 51.7 |
| Range | 22-45 | |
| Mean±SD | 29.8±4.6 | |
| Median | 30.0 | |
| **Gender:** | | |
| Male | 38 | 32.8 |
| Female | 78 | 67.2 |
| **Nursing qualification:** | | |
| Nursing school diploma | 3 | 2.6 |
| Technical institute diploma | 50 | 43.1 |
| Bachelor | 61 | 52.6 |
| Master | 2 | 1.7 |
| **Experience years:** | | |
| <5 | 29 | 25.0 |
| 5+ | 87 | 75.0 |
| Range | 1-23 | |
| Mean±SD | 7.6±4.7 | |
| Median | 7.0 | |

**Table (2):** Knowledge Assessment of IPSG Among Staff Nurses**.**

| **Knowledge of IPSG (Satisfactory 60%+)** | **(n=116)** | |
|---|---|---|
| | **No.** | **%** |
| Safety aims | 49 | 42.2 |
| Goal I | 54 | 46.6 |
| Goal II | 83 | 71.6 |
| Goal III | 68 | 58.6 |
| Goal IV | 84 | 72.4 |
| Goal V | 53 | 45.7 |
| Goal VI | 79 | 68.1 |

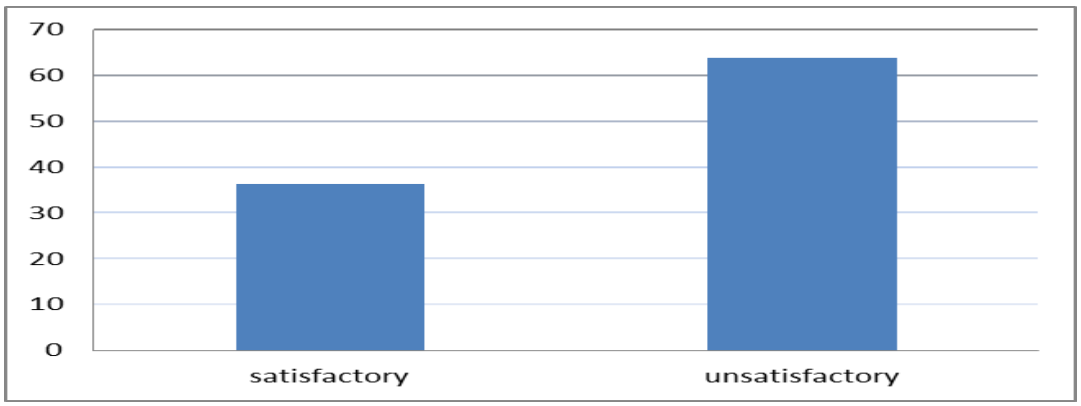


**Figure (1):** Total knowledge of IPSG among staff nurses.

**Table (3):** Total Practice of IPSGs Among Staff Nurses.

| Practice of IPSG (Adequate 60%+) | (n=116) No. | % |
|---|---|---|
| Goal I: | | |
| When giving medication: | 7 | 6.0 |
| When giving blood: | 7 | 6.0 |
| When taking blood specimens: | 9 | 7.8 |
| Total Goal I: | | |
| Adequate | 4 | 3.4 |
| Inadequate | 112 | 96.6 |
| Goal II: | | |
| Adequate | 8 | 6.9 |
| Inadequate | 108 | 93.1 |
| Goal III: | | |
| High alert medication: | 3 | 2.6 |
| Anticoagulant: | 5 | 4.3 |
| Medication reconciliation: | 8 | 6.9 |
| Total Goal III: | | |
| Adequate | 3 | 2.6 |
| Inadequate | 113 | 97.4 |
| Goal IV: | | |
| Hand hygiene: | 106 | 91.4 |
| Central line:[@] | 38 | 37.3 |
| UTI:[@] | 37 | 34.6 |
| Total Goal IV: | | |
| Adequate | 82 | 70.7 |
| Inadequate | 34 | 29.3 |
| Goal V: | | |
| Adequate | 6 | 5.2 |
| Inadequate | 110 | 94.8 |

(@) Excluding the not applicable

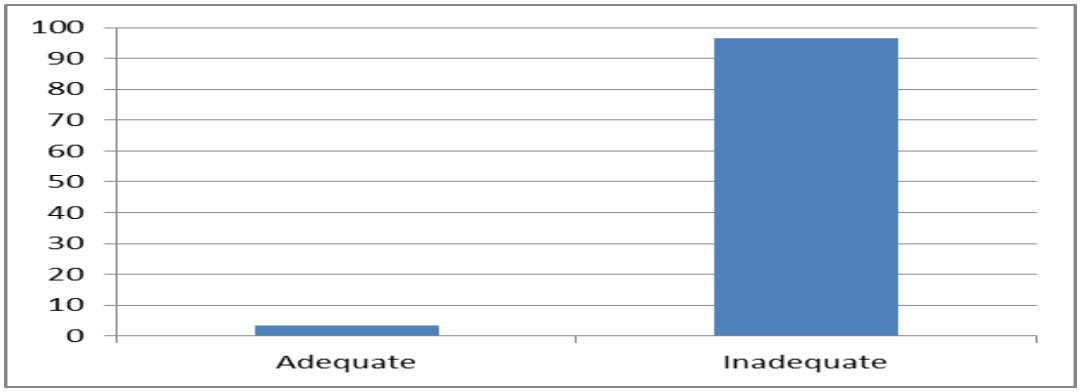


**Figure (2):** Grand total practice of IPSGs among staff nurses in the study.

## Discussion

According to the present study results, slightly less than half of the nurses were having a diploma degree in nursing. Their experience years were relatively short with medians less than ten years. These characteristics might explain the low levels of knowledge and practice among them given the lack of sufficient emphasis on this topic in nursing school curricula. In this respect, **Ji et al. (2021)** in the Republic of Korea developed an undergraduate

nursing program curriculum for patient safety and recommended its implementation throughout their educational years.

Moreover, the present study staff nurses in both groups had low previous attendance of training courses in patient safety; only around one-fourth of them reported such training. Yet, the study results identified the previous attendance of training courses as a negative predictor of their practice scores. This paradoxical finding might be explained by the questionable quality of such training as well as the eagerness of attendants to learn. In congruence with this, a study of the effectiveness of training interventions in Malaysia found that attendants' motivation to learn was a factor of considerable importance in the success of such programs **(Ibrahim et al., 2020)**.

In the current study results, the knowledge assessment of IPSGs among the staff nurses was generally low. This was most evident as relates to their knowledge of the safety aim. The only difference of significance between them was related to their knowledge of Goal IV which was significantly more satisfactory among staff nurses. Such a low level of satisfactory knowledge of patient safety goals among nurses would lead to more likelihood of errors that could be easily mitigated as clarified by **Rodziewicz et al. (2021)**.

only around one-third of staff nurses had satisfactory total knowledge, and the difference was not statistically significant. The present study assessed staff nurses' knowledge and practices related to the IPSGs. Their practices were mostly low. Thus, in their practice of Goal I concerning giving medication, it was noticed that only the routine essential steps of checking for physician order and for medication name were performed by most of them. Meanwhile, the remaining items concerning the dose, route and time of administration, or patient identification information were only performed by very few of them. These results would lead to very high probabilities of occurrence of medication errors.

## Conclusion

The study results concluded that the nurses in the study settings have unsatisfied knowledge regarding patient safety goals and inadequate practices level. so, educational programs are needed to improve their knowledge and practices.

## Recommendations:

In view of the markedly deficient staff nurses' knowledge and practice, and the benefits of training, the study recommends the following.

- Staff nurses in the study settings and in similar ones need intensive training in Patient Safety Goals (PSGs) to improve their related knowledge and skills.
- training approach should better be used given its higher effectiveness and better long-term retention at follow-up, in addition to its less demanding logistics.

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