# The impact of Developing Risk Managements Nursing Strategies on Nurse's Culture Safety

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*Abstract:* **Clinical risk management strategies emphases on refining the quality and safety of health care services by recognizing the conditions and chances that place patients at risk of harm and performing to stop these risks.** *Research purpose*: **This research explored evaluate the effect of developing risk managements nursing strategies on culture safety in critical care units at Damanhour National Medical Institute.** *Methods:* **A quasi- experimental pre and post –test research design was utilized. Critical and intensive care units at the time of conducting the study were recruited and arrange as follow: Neuro- surgery ICU (n=17), Coronary Care (n=16), Intensive care (n=20), at Damanhur National Medical Institute. The Subjects of this study comprised all staff nurses (n=53). Pre-designed Questionnaire Sheet: It was designed by the researcher in relation to nurses' characteristics as age, qualification, experiences, marital status, training course and working place. Culture Safety Attitudes Questionnaire (SAQ): It was used to measure safety culture. The critical care units version contains (30) items.** *Results:* **there was highly difference between scores of studied nurses according to team work climate, safety climate, job satisfaction and perception of management. But there was statically difference according to stress recognition and work conditions. 62.3% of studied nurses had low culture safety at pretest. While 71.7% of them had high culture safety at posttest and 66% of studied nurses had high culture safety at follow up test. There was high significance relation between age, qualification, years of experience and training courses with culture safety at p. value <0.01. There was highly significant positive predictor for Educational level, Years of experiences and Training course** *Conclusions:* **Developing risk management nursing strategies had highly positive improvement on culture safety. There was high significance relation between age, qualification, years of experience and training courses with culture safety.**

*Keywords:* **Risk management, strategies, culture safety.**

## 1. INTRODUCTION

An intensive care unit (ICU), also known as an intensive therapy unit or intensive treatment unit (ITU) or critical care unit (CCU), is a distinctive unit of a hospital that delivers thorough treatment. Intensive care is provided to patients with serious or life-threatening disorders and injuries, these patients need continuous care in order to make certain that their body is functioning normally. ICUs are operated by highly qualified doctors, nurses. ICUs are also different from other general wards by a greater staff-to-patient ratio and the availability of advanced medical technologies and equipment that are not regularly offered in different units *(Marshall et al., 2017).*

The ICU is a very unsafe place, not only for the patient but also for medical staff. First, from the perspective of the patient and family the admission to the ICU is frequently associated with unexpected injury or catastrophic illness. Second, from the perspective of the medical staff, many of the tasks in the ICU have clearly well-defined standards of care. Although standardization may be an advantage to patient safety, failure to follow recommended strategies increases the medical accountability. *(Chuang et al., 2016).*

Risk management strategies is a dynamic, consistent process and comprises several steps as shown at figure 1. Its main goal is to prevent risk or harm to patients and thus to provide culture safety and quality care. Culture safety should be understood by the nursing professionals. In this regard, the adoption of best practice in the field of risk management can allow the strengthening of the safety practices *(Aven, 2016).*

**Figure 1: Risk management strategies process:**
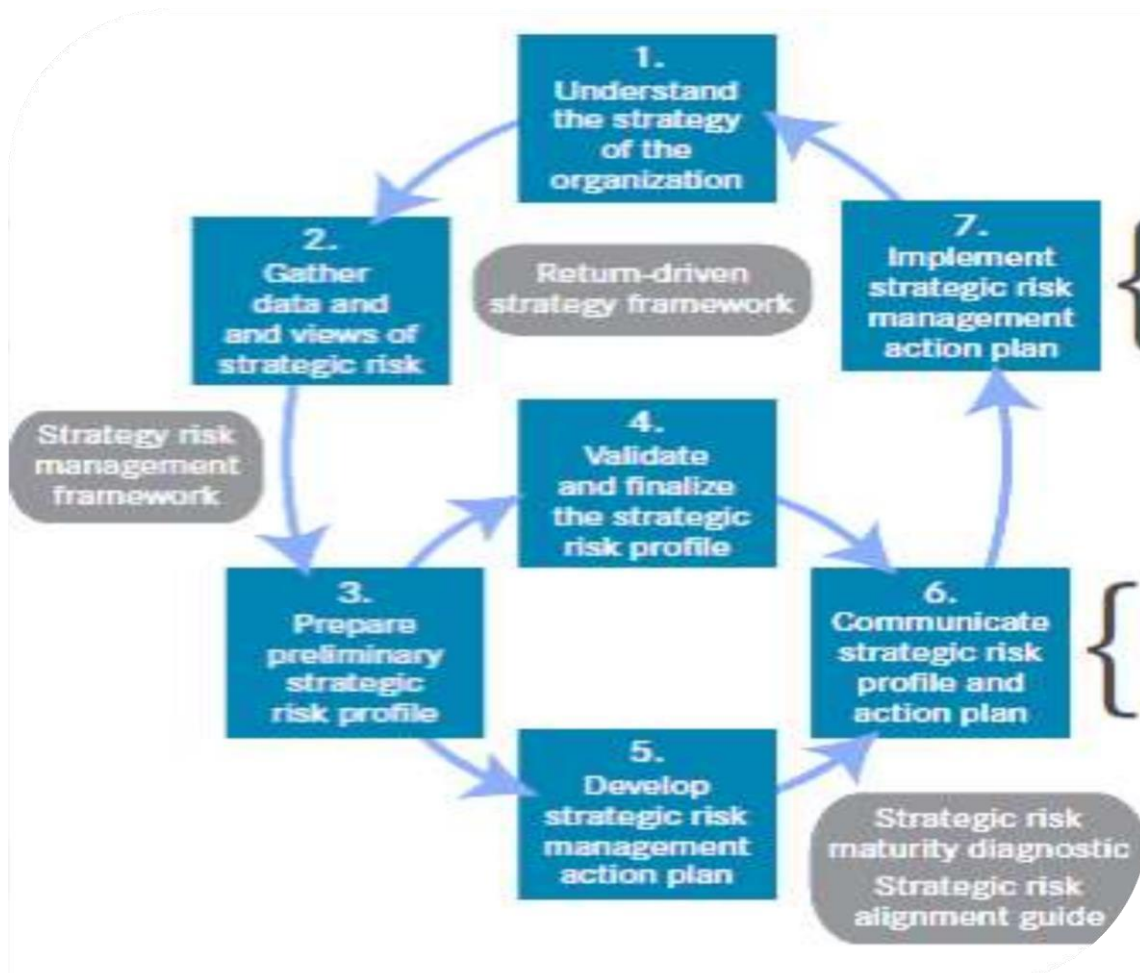


Higgins, A., Doyle, L., Downes, C., Morrissey, J., Costello, P., Brennan, M., & Nash, M. (2016). There is more to risk and safety planning than dramatic risks: Mental health nurses' risk assessment and safetymanagement practice. *International journal of mental health nursing*, *25*(2), 159-170

Patient and culture safety is one of the greatest challenges, which are in the domain of clinical risk management. Clinical risk management depends on error reporting based on trust in addition to error recognition. Improving culture safety and decreasing the possibility of clinical risk in hospitals is very important to improve nursing care quality, nursing patient relationship, satisfaction of patients and decrease medical errors and complains from nursing care *(Elmontsri et al., 2017).*

Risks to patient safety can also be lessened by means of patient-specific risk management strategies such as; avoiding expired treatments - Sending patients adequate notification of prescription expiration will support communication between patients and physicians thus reducing potential prescription medication abuse. Following up on missing test results - Patients who need to take additional medical tests following appointments may fail to do so, or the test results might get lost. Developing a plan to monitor receipt of test results guarantees the results are reviewed, so patients can then be consulted *(Danielsson et al., 2017).*

Tracking missed appointments - Implementing a system to follow-up with patients who miss appointments but fail to reschedule is another proactive step in managing patient risks. Communicating with patients - Patients may have limited understanding of information received from physicians. Having a strategy that checks the patient's comprehension of information reduces the likelihood that the patient will misinterpret a physician's orders or will improperly take medication *(Elsheikh et al., 2017).*

Prevent falls and immobility - Making minor modifications to things like bed rails, bathtubs and toilets lacking grab bars, institutional lighting, and the conditions of the ground can significantly reduce the risks of such hazards. Sufficient record retention - Keeping patient records on file for an extended period of time or indefinitely is useful for monitoring patient health, even when patients are not actively seeking care. Risk management protocol should also have plans in place for disposing of records in accordance with federal mandates *(Lutchman et al., 2016).*

Nurses are still human and can make mistakes, although they are well trained and highly skilled. In this case, patient safety outcomes can be affected. Sometimes the health care setting contributes to poor outcomes by defining procedures that provide poor oversight or inappropriate guidelines for dealing with hazardous situations. When incidents occur that endanger patients, risk management experts perform a "root cause analysis" to determine what went wrong and why *(Steege & Pinekenstein, 2016).*

Nursing skills and commitment to patient are strong nurses' experiences for the risk management strategies. Nurses can re-form the situations that produced the error for example, when patients are misidentified or foreign objects are left inside patients, and if wrong medications are administered or when patients acquire infections while they're in the hospital. Following risk management strategies, nurses analyze the problem and ask for steps to decrease the probability of repetition and consequently enhance culture safety. *(Coronado-Vázquez et al., 2017).*

Cultural safety is about effective relationships between nurses and patients. Patients are encouraged to agree on what is culturally safe rather than act passively in accordance with the power of nurses. The basic principle of cultural safety is based on a trust relationship in which the patient is at liberty to negotiate their nursing care. Cultural safety necessitates a degree of cognitive, attitudinal and personal skills that enrich communication and interaction with others. Enhancing cultural safety is a process rather than an end point. It comprises personal thoughtful practice as a way of distinguishing values essential in the culture of critical care nursing, and one's own culture, which may conflict with others *(Richardson et al., 2017).*

## 2. RISK MANAGEMENT STRATEGIES

Today if any healthcare organization conduct risk management strategies they must follow these steps. **Risk management Process** are as follows:

• Coach critical care nurses about all characteristics of risk management strategies as well as responding to crisis, prevent, management of it.

• Sustain whole and precise documentation for extra reference.

• Sustain appropriate departmental harmonization so that every nurse become at the same level which advances the risk management process and improves safety against misconduct and malpractice claims.

• Inspire critical care nurses to take steps to avoid what is preventable.

• Ensure immediate improvement of risks that are inevitable with unlimited precision and haste.

• Handle objections rapidly with a view to diminish risks to the health setting.

• Direct critical care nurses about reporting an unusual event with a view to diminish risks to the health setting.

**Implementation of Risk management strategies for Patient care:**

Risk management is essential in the health care settings as patient care and culture safety are the primary target. Risk management is concerned with reducing errors through reporting and discovering real or possible lacks in the process of patient care and culture safety. But occasionally due to unsuitable nursing management, culture safety is at risk. Thus, risk management strategies should be followed in all health care settings.

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**Following of risk management strategies are:**

• Following wasted appointments.

• Preserve a patient record for additional order and prescription.

• Not filling expired prescriptions.

• Good communication with the patients

• Follow up on missing investigation results.

**Research Hypothesis**

The following hypotheses are formulated:

**H1**:There is an positive effect of developing risk managements nursing strategies on culture safety

**H2**: There is a significant relation between nurses' characteristics and culture safety

## 3. MATERIAL AND METHODS

**The Aim of the study:**

The aim of the  study was to evaluate the effect of developing risk managements nursing strategies on culture safety in critical care units  at Damanhour National Medical Institute.

**Research design:**

A quasi- experimental pre and post –test research design was utilized.

**Setting**

The study was conducted at Damanhur National Medical Institute. It included critical and intensive care units at the time of conducting the study were recruited and arrange as follow: Neuro- surgery ICU (n=17), Coronary Care (n=16), Intensive care (n=20), at Damanhour National Medical Institute. The institute is affiliated to the General Organization for Teaching Hospital and Institutes; and is considered the main teaching hospital in El-Beheira.

**Subjects**

The  Subjects of this study comprised all staff nurses'(n=53) who were actually working in all critical and intensive care units at the time of conducting the study were recruited and arranged as follow: Neuro- surgery ICU(n=17),Coronary Care (n=16), Intensive care (n=20), at Damanhour National  Medical Institute.

**Tool for data collection:**

Two tools were used in this study:

**I.  Pre-designed Questionnaire Sheet:**

It was designed by the researcher after reviewing the related literature and reviewed by supervisors. It was written in an Arabic language for gathering data in relation to nurses' characteristics as age, qualification, experiences, marital status, training course and working place.

**II.  Culture Safety Attitudes Questionnaire (SAQ):**

It was used to measure safety culture which was adapted from **Buljac-Samardzic et al., 2016**). The critical care units version contains (30) items for measuring (6) domains of safety culture: teamwork climate (6 items) as Nurse input is well received in this  ICU, safety climate (7 items) as Medical errors are handled appropriately in this  ICU , job satisfaction (5 items) as This  ICU  is a good place to work, stress recognition (4 items) as I am less effective at work when fatigued , perceptions of hospital management (4 items) as The hospital administration supports my daily efforts, and working conditions (4 items) as Trainees in my discipline are adequately supervised.  **Scoring system:**

All items of SAQ questionnaire were developed based on the 5-point Likert response scale of agreement ("Strongly disagree "1" to "Strongly agree "5"). These scores were summed and were converted into a percent score. It was classified into 3 categories:

- **High culture safety** if score > 75%.

- **Moderate culture safety** if score from 50 - 75%.

- **Low culture safety** if score <50%.

**Preparatory Phase**

This phase included reviewing of literature related to developing risk managements nursing strategies and culture safety. This served to develop the study tools for data collection. During this phase, the researcher also visited the selected places to get acquainted with the personnel and the study settings.

**Ethical Considerations**

The research approval was obtained from the Faculty Ethical Committee before starting the study.

**The ethical research considerations include the following:**

▪ The researcher was clarified the objectives and aim of the study to nurses included in the study before starting

▪ Verbal approval was obtained from the nurses before inclusion in the study; a clear and simple explanation was given according to their level of understanding. They secured that all the gathered data was confidential and used for research purpose only.

▪ The researcher was assuring maintaining anonymity and confidentiality of subjects' data included in the study

▪ The nurses were informed that they are allowed to choose to participate or not in the study and they have the right to withdrawal from the study at any time.

Afterwards, the study was conducted through four consecutive phases: assessment, planning, implementation and evaluation.

• **Assessment phase:** This phase aimed to identify the studied nurses' characteristics; to assess nurse's knowledge of risk management strategies and culture safety. Tools (I & II,) were translated into Arabic and tested for content and face validity by a jury of five experts (five professors of nursing administration) and some modifications were done. The tools used in this study had high reliability, by using Cronbach's Alpha Coefficient test: Culture Safety Attitude Questionnaires (SAQ) (0.91).

**Pilot Study**

The pilot study was carried out on 6 nurses those represent 10% of nurses at the previous mentioned setting in order to test the applicability of the constructed tools and the clarity of the included tools. The pilot has also served to estimate the time needed for each subject to fill in the questionnaire.

• **Preparatory Phase**

This phase included reviewing of literature related to risk management strategies and nurses culture safety. This served to develop the study tools for data collection. During this phase, the researcher also visited the selected places to get acquainted with the personnel and the study settings.

• **Planning and preparatory phase:**

Based on the assessment phase, the educational intervention content and the educational intervention handout were prepared by the researchers, in Arabic language to suit nurses' level of understanding, to improve the nurses' knowledge of risk management strategies and safety culture based on the related literature (**Coronado-Vázquez, V etal 2017, Reis, G. A 2017**) . It included theoretical knowledge and some illustrative diagrams ris  on Accordingly, some modifications were done, and then the final forms were developed

• **Implementation phase:** Tools (I, II) were filled in the clinical area by the studied nurses. Nurses were divided into three main groups according to study settings. Total of 4 sessions and the duration of each session took approximately 1 to 1.5 hours, sessions started according to nurses' spare time. Educational sessions were held for 4 days/week. At the start of the educational intervention, each nurse obtained educational intervention handout. In the first 2 sessions, the researcher started to establish relationship with nurses, then verbal guidelines, based on educational intervention handout. Each nurse was contacted at least once/week for about 3 months to reinforce provided knowledge and to respond to their questions if any. Methods of teaching used were: interactive lectures and group discussion. Instructional media was used; it included educational intervention handout and visual materials. The nurses were interested in the topic and they asked to repeat such educational intervention for nurses in different health care settings.

• **Evaluation phase:** the evaluation phase was emphasized by using the study tools to assess the effect of the educational intervention on nurses' knowledge at immediately and after three months post-educational intervention implementation; for nurse's safety culture

Data were collected in three months, from the beginning of Jan 2019 to the end of April 2019. The researcher first met with the nurses worked at the previously mentioned settings, explained the purpose of the study after introducing himself. The researcher was visiting the study setting 2days / week at morning shift (8a.m-2p.m) and afternoon shift (2pm8pm) to collect data. The questionnaire was filled by nursing staff which take 20-30 minutes as pretest then providing risk managments nursing strategies within five session, every session around 50-60 min, then collecting data as posttest, then after 6 weeks collecting data as follow-up test.

### III.Statistical Analysis

Personal Computer (PC) was used to enter the data collected from the studied sample after being reviewed, coded. Statistical analysis was fulfilled using the Statistical Package for Social Sciences (SPSS) version 22. Data presentation was done using descriptive statistics in the form of frequencies, percentages. Friedman test nonparametric statistical **test** developed by Milton **Friedman**. It was used to detect differences in treatments across multiple **test** attempts. Spearman correlation measures the strength and direction of association between two ranked variables. **Multiple linear regression** is used to explain the relationship between one continuous dependent variable and two or more independent variables.

## 4. RESULTS

**Table (1): Number and Percentage Distribution of the Nurses according to Characteristics (n=53).**

| Nurses' characteristics | No | % |
|---|---|---|
| **Age** | | |
| 20 - <30 | 9 | 17 |
| 30 - <40 | 21 | 39.6 |
| 40 or more | 23 | 43.4 |
| $\bar{x}$ **31.47±8.91** | | |
| **Qualification** | | |
| Diplome | 19 | 35.8 |
| Technical Health Institutes | 24 | 45.3 |
| Bachelor | 10 | 18.9 |
| **Work place** | | |
| coronary care unit | 16 | 30.2 |
| Intensive care unit | 20 | 37.7 |
| Neurosurgery care unit | 17 | 32.1 |
| **Years' experience** | | |
| 5 -15years | 27 | 50.9 |
| 15 - 25 years | 17 | 32.1 |
| >25 years | 9 | 17 |
| $\bar{x}$ **16. 8±7.2** | | |

| Marital status | | |
|---|---|---|
| Married | 39 | 73.6 |
| Not Married | 14 | 26.4 |
| **Training course** | | |
| Yes | 19 | 35.8 |
| No | 34 | 64.2 |

**Table 1:** This table shows that the mean age of studied nurses is $\bar{x}$ 31.47±8.91. According to qualification, this table shows that 18.9 of them had Bachelor education. This table reveals that 37.7%, 73.6% and 64.2% of studied nurses worked at ICUs, was married and not attended training courses, respectively. This table shows that the mean years of experience was $\bar{x}$ **16. 8**±7.2.

**Figure 1: Percentage distribution of nurses regarding working place (N=53)**
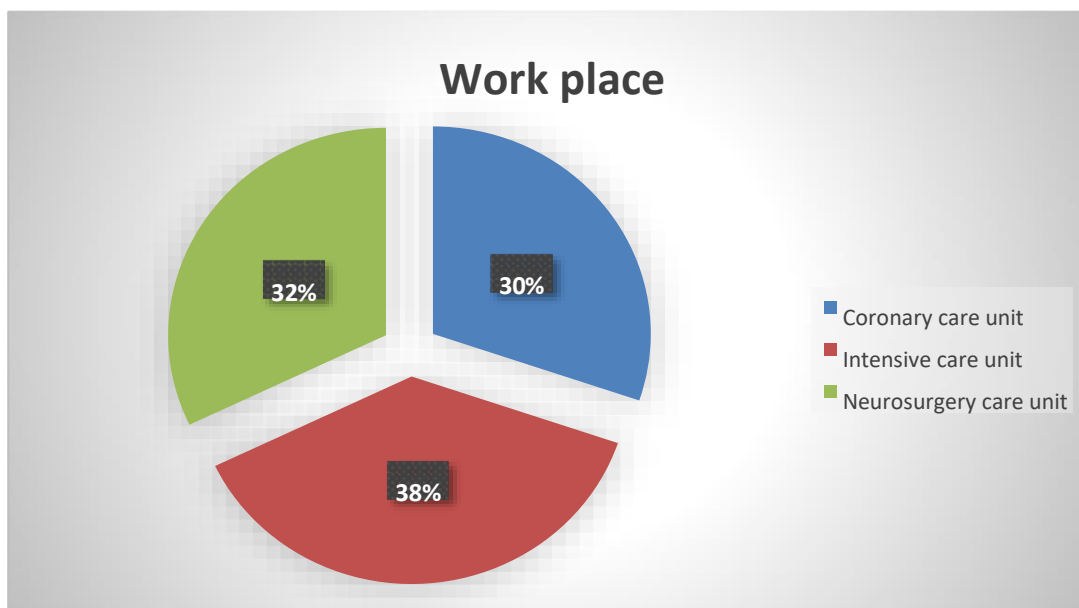


**Figure1:** This figure shows that 38% of studied nurses worked at intensive care unit, 32% and 30% of studied nurses worked at neurosurgery care unit and coronary care unit, respectively.

**Table (2): Means score distribution of the nurses according culture safety (No= 53)**

| Domains | Pre | Immediately Post | Follow up After four months | Friedman test | |
|---|---|---|---|---|---|
| | | | | $X^2$ | P. value |
| Teamwork climate | 16.52±2.3 | 27.55±2.9 | 25.19±2.08 | 7.56 | .001** |
| Safety climate | 21.42±1.6 | 29.37±3.6 | 26.77±1.78 | 8.91 | .001** |
| Job satisfaction | 14.07±3.07 | 21.45±2.10 | 19.37±1.99 | 6.15 | .002** |
| Stress recognition | 12.05±2.16 | 15.26±1.71 | 13.84±2.00 | 2.04 | .017* |
| Perceptions of management | 12.11±1.74 | 17.99±1.62 | 16.40±1.69 | 9.22 | .000** |
| Working conditions | 13.00±1.92 | 16.01±1.35 | 15.11±0.91 | 3.61 | .014* |
| Total | 97.55±9.64 | 131.97±12.17 | 123.48±10.44 | 12.58 | .000** |

* Statically difference** highly difference

**Table 2:** This table shows that there was highly difference between scores of studied nurses according to team work climate, safety climate, job satisfaction and perception of management. But there was statically difference according to stress recognition and work conditions.

**Figure 2: Distribution of nurses regarding total culture safety pre, post and follow up (N=53).**
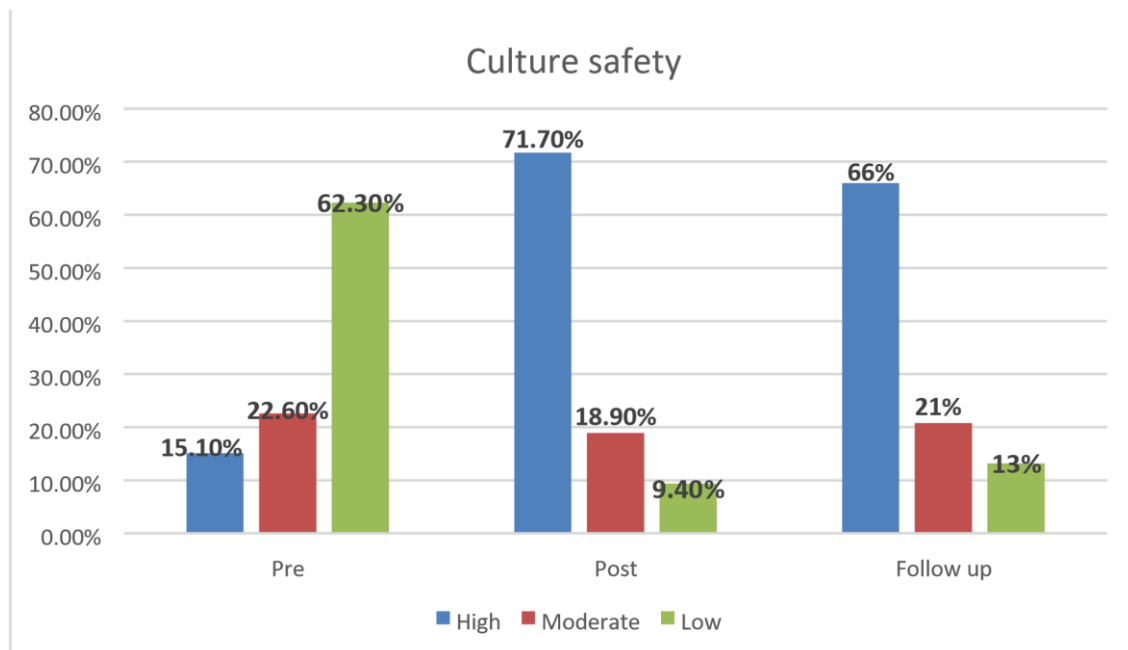


**Figure 2**: This figure shows that 62.3% of studied nurses had low culture safety at pretest. While 71.7% of them had high culture safety at posttest and 66% of studied nurses had high culture safety at follow up test.

**Figure 3: Distribution of mean score & standard deviation regarding total culture safety pre, post and follow up (N=53).**
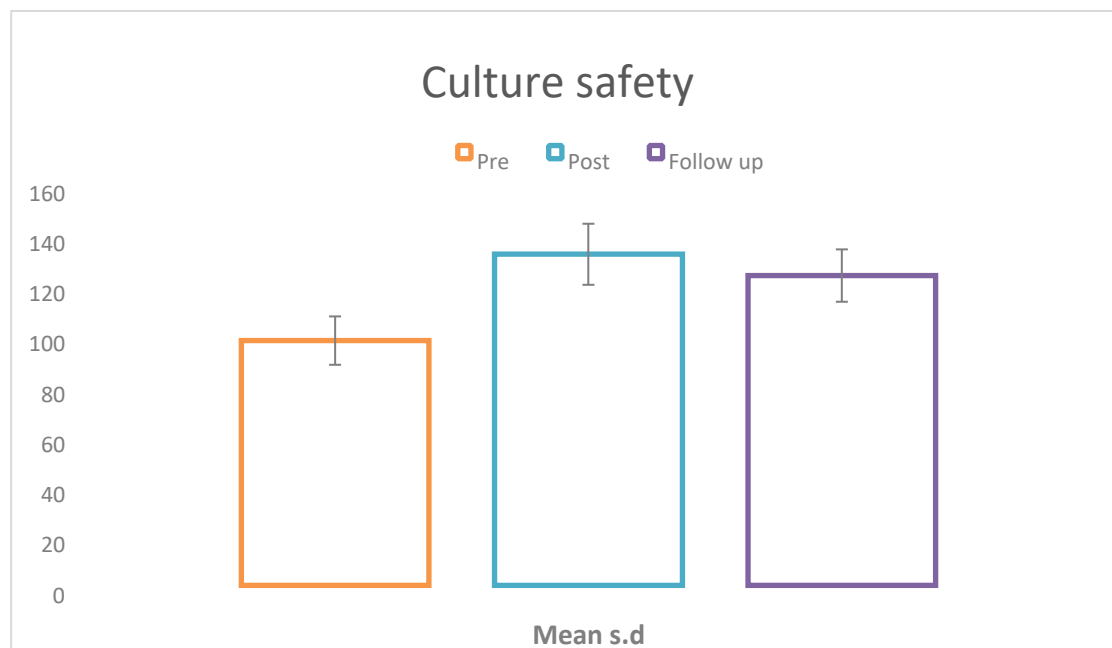


**Figure 3**: This figure shows that mean total scores of culture safety pre, post, follow up are 97.55±9.64, 131.97±12.17 and 123.48±10.44, respectively.

**Table 3: Relation between nurses' characteristics and total culture safety**

| Items | | Total Culture safety | | | | | | $X^2$ | P-Value |
|---|---|---|---|---|---|---|---|---|---|
| | | High 38 | | Moderate 10 | | Low =5 | | | |
| | | N | % | N | % | N | % | | |
| Age | 20 - <30 | 8 | 21 | 1 | 10 | 0 | 0 | 9.156 | .002** |
| | 30 - <40 | 15 | 39.5 | 4 | 40 | 2 | 40 | | |
| | 40 or more | 15 | 39.5 | 5 | 50 | 3 | 60 | | |
| Qualification | Diplome | 15 | 39.5 | 0 | 0 | 4 | 80 | 7.541 | .007** |
| | Technical Health Institutes | 16 | 42.1 | 7 | 70 | 1 | 20 | | |
| | Bachelor | 7 | 18.4 | 3 | 30 | 0 | 0 | | |
| Marital status | Married | 29 | 76.3 | 6 | 60 | 4 | 80 | 1.846 | .064 |
| | Not Married | 9 | 23.7 | 4 | 40 | 1 | 20 | | |
| Work place | coronary care unit | 11 | 28.9 | 4 | 40 | 1 | 20 | 2.661 | .054 |
| | Intensive care unit | 15 | 39.5 | 3 | 30 | 2 | 40 | | |
| | Neurosurgery care unit | 12 | 31.6 | 3 | 30 | 2 | 40 | | |
| Years of Experience | 5 -15years | 22 | 57.9 | 4 | 40 | 1 | 20 | 10.564 | .001** |
| | 15- 25 years | 10 | 26.3 | 6 | 60 | 1 | 20 | | |
| | >25 years | 6 | 15.8 | 0 | 0 | 3 | 60 | | |
| Training Course | Yes | 13 | 34.2 | 5 | 50 | 1 | 20 | 11.047 | .000** |
| | No | 25 | 65.8 | 5 | 50 | 4 | 80 | | |

**Table 3:** This table shows that there was high significance relation between age, qualification, years of experience and training courses with culture safety at p. value <0.01. On the other hand, there was no relation between marital status and work place with culture safety at p. value > 0.05.

**Table (4): Multiple Linear regression model for nurses' characteristics and culture safety**

| | Unstandardized coefficients | | Standardized coefficients | T | P. value |
|---|---|---|---|---|---|
| | Beta | Std. Error | Beta | | |
| **Age** | .728 | .024 | .647 | 8.117 9.561 | .002** |
| **Educational level** | .824 | .038 | .546 | 10.04 | .003** |
| **Years of experiences** | .795 | .049 | .628 | 3.640 | .001** |
| **Working place** | .220 | .055 | .311 | 11.91 | .056 |
| **Training course** | 1.74 | .028 | .790 | | .000** |
| a.    Dependent Variable: Culture safety | | | | | |
| b.    Predictors: (constant), Educational level, Years of experiences, Working place, Training course | | | | | |

**Table (4):** It indicates that there was highly significant positive predictor for Educational level, Years of experiences and Training course. On the other hand, there was no significant predictor for working place on culture safety.

## 5. DISCUSSION

Regarding nurses' characteristics, the current study showed that mean age and years' experience of studied nurse was 31.47±8.91 and 16.8 ±7.2, respectively. Regarding qualification of nurses, this study revealed that only less than one fifth of them had bachelor nursing. This results inconsistent with the study performed by **Kuy & Romero, 2017** titled in improving staff perception of a safety climate with crew resource management training, who reported that, mean of years' experience was 8.36 and almost of them had bachelor nursing. This results disagreement with the study performed by **Reis et al., 2017** titled in Nurse manager perceptions of patient safety strategy implementation, who revealed that more than one third of studied nurses participated at post graduate courses.

Regarding culture safety, the current study showed that there was highly difference between scores of studied nurses according to team work climate, safety climate, job satisfaction and perception of management. This results may due to the eminence of the sessions of strategy illustration, Nurses are keen about learning about risk management because they consider it a key problem. This result agreement with the study performed by **Xie et al., 2017** titled in a safety culture training educational intervention enhanced the perceptions of patient safety culture of nurse managers, who reported that there was positive effect for educational intervention on culture safety. Also, supported with the study performed by **Suliman et al., 2017** titled in Exploring Safety Culture in Jordanian Hospitals.

Regarding culture safety, the current study showed that there was slight statically difference according to stress recognition and work conditions. This results may due to work environment of nurses has many complicated problems such as a shortage in their number, a deficit in supplies, a lack of financial and without specific job description for critical units. This results inconsistent with the study performed by **Magtibay et al., 2017** titled in Decreasing stress and burnout in nurses: Efficacy of blended learning with stress management and resilience training educational intervention, who reported that highly improvement at stress & burn out after training educational intervention. While This study agreement with the study conducted by **Cho et al., 2016** titled in A convergence study on the hospital nurse's perception of patient safety culture and safety nursing activity, who reported slight improvement at work condition after educational educational intervention.

Regarding total culture safety, the current study showed that less that two thirds of studied nurses had low culture safety at pretest. While more than two thirds of them had high culture safety at posttest and two thirds of studied nurses had high culture safety at follow up test. This results may due to commitment of nurses to attend theoretical training and compliance with the directives also depending on the educational level of nurses when preparing scientific material of strategy. This results supported with the study performed by **Farokhzadian et al., 2015** titled in Assessment of clinical risk management system in hospitals: an approach for quality improvement and **Ammouri et al., 2015** titled in Patient safety culture among nurses who reported that more than two thirds of studied nurses had high culture safety after training educational intervention.

According to the relation between studied nurses' characteristics and culture safety. The current study showed that there was highly significance relation between age, qualification, years of experience and training courses with culture safety at p. value <0.01. On the other hand, there was no relation between marital status and work place with culture safety at p. value > 0.05. This results supported with the study conducted by **Elsous et al., 2016** titled in a cross-sectional study to assess the patient safety culture in the Palestinian hospitals: a baseline assessment for quality improvement, who reported that nurses' characteristics had positive impact on safety culture. Also, this results consistent with the study performed by **Aljadhey et al., 2016** titled in Culture of safety among nurses in a tertiary teaching hospital in Saudi Arabia.

Regarding multiple linear regression, this current study showed that that there was highly significant positive predictor for Educational level, Years of experiences and Training course. On the other hand, there was no significant predictor for working place on culture safety. This table agreement with the study performed by **Chi et al., 2017** titled in Using linear regression to identify critical demographic variables affecting patient safety culture from viewpoints of physicians and nurses, who reported there was positive impact for nurses' characteristics as supervisor/manager" and "experience in position" are the 2 most important demographic variables influencing the patient safety culture.

## 6. CONCLUSION

Developing risk management nursing strategies had highly positive improvement on culture safety. There was high significance relation between age, qualification, years of experience and training courses with culture safety. There was highly significant positive predictor for Educational level, Years of experiences and Training course.

## 7. RECOMMENDATIONS

**According to the results of current study, the following recommendation are suggested:**

Applied risk management nursing strategies at others unit not only critical units. Continuous training of nurses at critical units about culture safety. Further researchers with increasing sample size, about effect of developing risk management nursing strategies on culture safety. Orientation program for newly nurses must contain risk management nursing strategies. Assess effectiveness of strategies risk management on other variables as "turnover and quality of care".

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