# Clinical Risk Management in Healthcare Organization as Perceived by Staff Nurses

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## Abstract

**Background**: Clinical risk management (CRM) is the cornerstone of the system approach to achieve patient safety, human error management in health care, and reduction of the incidence and impact of preventable adverse events. It is related to risk management of clinical care in healthcare setting. **Research objectives**: The main purpose of this study is to assess the perception of staff nurses of the clinical risk management in private and governmental hospital. **Subjects and Methods**: A descriptive research design was used in carrying out this study. It was conducted at two hospitals: private and governmental hospital. Subjects of the study included 300 nurses. The data collection forms consisted of two tools namely, clinical risk management questionnaire and risk program occurrence checklist. **Results:** The overall study subject had perceived moderate level of CRM (40.54 ± 16.89). However, the studied nurses in the private hospitals had perceived higher level of clinical risk management than nurses in governmental hospital (53.23 ± 15.43, 27.85 ± 3.17) respectively. **Conclusion:** This study concluded that all the studied staff nurses perceived moderate level of CRM. However, there was a significant difference according to hospital ownership, as the governmental hospital perceived lower level of CRM and risk management program than those in private hospital. **Recommendation**: Developing training programs for nurses to improve their knowledge and skills of CRM.

**Keywords**; Clinical risk, clinical risk management, nurses, risk programs, perception, healthcare organization

## Introduction:

Contemporary improvements in healthcare and changes in patients' values and expectations have created important challenges in health care practices, such as advanced technology, multiple professional experiences, non-uniform management models, patient specificity, and surgery complexity. **Loveday, et al., (2014).** These challenges highlight the necessity to construct a system able to identify and exclude clinical risks, waste, and errors from healthcare processes, to suggest organizational solutions for continuous improvement, and to root the importance of effective safety and risk management in hospitals among healthcare providers. **(Adibi, Khalesi, Ravaghi, Jafari, & Jeddian, 2012 & Kohn et al., 1999).**

Risk management, either proactive or reactive approaches, include activities to reduce the frequency and severity of unexpected incidents, to decline the effect of patients' legal claims and the potential for liability and to promote high reliability performance, and system design. Management of hospital risks

should cover all healthcare risks, both clinical and non-clinical ones **(Lambert et al., 2016; Mojtahedi, & Oo, 2017; Getele, Li, & Arrive, 2019; Zakaria, et al., 2019).**

Clinical risk is the probability of an adverse event voluntarily or involuntarily that affects the patient resulting from variance of intended treatment, or therapeutic intervention, or diagnostic result. Furthermore, it is the failure in medical treatments such as wrong medications and failure to comply with requirement. **(Kohn et al., 1999; Wilson and Tingle 1999; Sale, 2005; Fumagalli, et al., 2020).** Studies have indicated that between 4% and 17% of patients suffer from harm because of clinical risks, including disability, morbidity, prolonged length of stay, and even death **(Baker et al., 2004; Johnstone & Kanitsaki, 2007; Hoonhout et al., 2009; Groves, Meisenbach, & Scott-Cawiezell, 2011).** Moreover, clinical risk could cause serious problems in healthcare and annually kill more people than AIDS or breast cancer **(Adibi et al., 2012).**

Clinical risk can be handled through developing and implementing the clinical risk management (CRM) system in hospital **(Briner et al., 2013)**. CRM is a specific form of risk management and it's related to administrative and clinical efforts that encompass all structures, processes, instruments and activities that enable— healthcare providers including nurses to identify, analyse, contain and manage risks while providing clinical treatment and patient care **(Briner et al., 2010).** CRM is an approach for improving the quality and safe healthcare through identifying conditions that put patients at risk and creating mechanisms to minimize or inhibit these risks **(Valentina, et al., 2014).**

Healthcare organization must ensure that top medical and nursing management setting up and maintenance of CRM **(Pfleger, Officer, & Turner,2019).** In addition, nurses in all levels and areas of practice have a stringent responsibility to reduce and where possible prevent the incidence and impact of adverse events in the contexts in which they work. **(Calderón-Larrañaga, et al., 2012).**

CRM maturity in hospitals identified through assessing staff's knowledge, understanding and recognition of CRM, the status of CRM organizing, the status of policies and procedures of CRM, status of the CRM training, CRM position, and monitoring of analysis, evaluation, and risk control.**( Zaboli et al., 2011).** In addition, it assessing the occurrence of hospital risk management program such as the risk management committee and team, the patient safety committee and team, the risk manager, the educational program & culture building, the patients' complaints management, the reporting system for adverse drug reactions, incident reporting form, and the root-cause analysis of sentinel events.**(Farokhzadian, Nayeri, & Borhani, 2015).**

The majority challenges in CRM implementation in Egypt were lacking for activation of the policies due to unstable political environment, lack of awareness about risk management culture and lack of experience in this field**(Abd El Fatah et al ., 2019)**. Also, fragmentation of services provision and inappropriate organizational structure of health system, absence of participatory vision and action between all stakeholders, weak supervision and monitoring as well as inappropriate health care work environment **(Campbell et al., 2002; Abd El Fatah et al ., 2019)**. In addition, there are some obstacles and gaps in the

healthcare system, such as using risk bureaucratic data collection rather than diagnosing potential problems; a lack of consultation with a sufficiently wide group of stakeholders including patients; lacking in consistency and transparency, presence of high percentage of medical errors ( more than 90%) in healthcare processes as evidenced in Egyptian researches **(Ashour, 2018& El lethiey 2016).**

## Significance of the study:

From this perspective, this research will fill this gap through exploring and identifying information about key enablers of CRM and programs in hospitals and assessing the CRM levels in hospitals to open the door for the hospital industry to engage in discussions on whether current practices for recruitment and training are adequate and whether a stand-alone risk standard or approach is needed.

## Aim of the study

The aim of the study is to investigate staff nurses' perception of clinical risk management in healthcare hospitals

### Research question:

What is staff nurse's perception of clinical risk management in in healthcare hospitals?

### Material and Methods

**Research Design:** A descriptive research design was utilized to conduct this study.

**Setting:** This study was conducted in two hospitals; governmental hospital is Alexandria Main University;

and the private hospital is Mabret El Asafera. These hospitals were selected because they have the highest occupancy rate in Alexandria governorate, and the bed capacity is more than 50 beds.

**Study subjects**: The sample size was determined based on the Epi Info program for each study setting. Sample size was 329 out of 1084. Acceptable error =5% and $\propto= 0.05$ , minimum sample size represents 30% of the total population, design effect =2. Only 300 nurses agreed to participate in the study from the selected study subject using simple random sampling to choose the study subject Main university hospital (n=150 out of 179), and Mabrat El Asafra hospitals (n=150). Inclusion criteria: staff nurses had experience more than one year in the pre-selected hospital to be oriented with different policies and procedures in the hospitals

**Measurement**
Two tools were used for data collection, i.e.,

**Tool I: Clinical Risk Management Questionnaire (CRMQ).** It was developed by (**Zaboli et al.,2011**) to assess perception of nursing staff of the CRM domains in hospitals. It consists of 45 items divided into six domains namely; staff's knowledge, understanding and recognition of CRM (8 items); the status of organizing the CRM (7it ems); the policies and procedures (7 items); evaluation of the status of CRM training (8 items); the position of CRM in the hospitals (6 items); the status of monitoring, analysis, evaluation, and risk control (9 items).

**Scoring system:** Responses were rating using five points Likert Scale ranging from 1 = (very low) to 5 = (very high). The scores of the statement of each component were summed-up, converted

into percent score and the total divided by the number of the items giving a mean score for each component. The perception level of CRM was considered poor if the total percent score was less than 33.33% and moderate if total score was ranged from 33.33%to less than 66.66% and high if the total scores was 66.66% and more than.

**Tool II. Risk Management program checklist.** It was developed by **Farokhzadian et al 2015**, to assess the occurrence of the risk program in the preselected settings as perceived by studied nurses. It included 25 items.

**Scoring system:** Responses were rating using yes occur = 2 or not occur =1 if the program not occur in the hospital.

In addition, socio-demographic and work related questions were developed by the researcher, related to age, gender, social status, educational qualifications, and years of experience, and ownership of hospital.

**Ethical consideration**

Prior to the actual work of research study, ethical approval was obtained from the Scientific Research Ethical Committee of the Faculty of Nursing at Alexandria University. In addition, informed consent was obtained from each staff nurse to participate in the study. The subjects were informed about the study aim and their rights to participate or refuse or withdraw from at any time without giving any reason and the collected data kept confidential and used for research only.

**Methods:**

**Preparatory phase:** A formal permission has been obtained from the authoritative authorities of the Faculty of

Nursing, Alexandria University and from the hospital and nursing directors of the studied hospitals to conduct the current study.

**Validity and Reliability**

The two tools were adapted, translated into Arabic , and back translated into English and submitted to a panel of five experts, three professors from the Nursing administration department, and two professors from the critical care nursing department from Faculty of Nursing, Alexandria University to review and test face and content validity, to give their suggestions and recommendations regarding the tools' contents, the nature of questions, clarity of items.Their comments were taken into consideration for ensuring accuracy and minimizing potential threats to validity of the study.

Also, the study tools were examined for reliability by measuring the internal consistency of items using Cronbach's alpha coefficient test. The two tools were proved to be reliable where $\alpha$ = 0.80 for the tool I (Clinical risk management questionnaire) and 0.76 for tool II (risk management program checklist) at a statistical significance level $p \leq 0.05$.

**Pilot study:**

The pilot study was carried out on 30 staff nurses who represents10% of the total of the study subjects. The aim of the pilot study was to examine the applicability of the tool, clarity of language, test the feasibility and suitability of the designated tools. It also served to estimate the time needed to complete the forms by each study subject and identifying potential obstacles and problems that may be encountered during data collection. The time for filling the

questionnaires took around 20-25minutes. A pilot study was conducted in June 2019. Data obtained from the pilot study was analysed and no modifications were done. Study sample included in the pilot were not included in the main study sample.

### Field work

Selected study sample were approached through self-administered questionnaires while they were in their work unit and at the break time. Instructions needed were provided before the distribution of questionnaire. The questionnaire was completed in the presence of the researcher to ensure objectivity of nurse's response, no contaminated of their opinion and check that all items were answered. The amount of time needed to fill the questionnaire was about 15-20 minutes for each nurse. Data collection phase consumed a period of three months from July 2020 till the end of September 2020.

### Statistical analysis:

The researchers coded the data and fed it to the statistical package of social science (IBM SPSS), version 25. Frequency and percentages were utilized to define demographics and work-related characteristics. Arithmetic mean and standard deviation (SD) were used for quantifying the studied variables (descriptive statistics). All statistical analyses were performed using an alpha error of $p \leq 0.05$. An alpha error of 0.05 was used for all statistical analyses.

### Results

**Table 1** shows that the majority (93.3%) of the studied nurses were female, and about more than one third (39.7%) of the studied nurses were in the age group

ranging from 41 to less than 50 years old. Regarding working unit, about more than one third (35% of the studied nurses were working in medical units, while 26.7% ,26.3% of nurses were working surgical and intensive care units respectively . According to educational qualifications, 39% of the nurses had BSC degrees working in two studied groups; while in private hospitals 58% of nurses had BSC compared to 68% of nurses who working in governmental hospital had Diploma of Secondary Technical Nursing School. Alternatively,67% of the nurses were married in private hospitals, while married nurses in governmental hospital constitute 59.3%. Concerning years of experience, about less than half (44.7%) of the nurses in all study settings had from 5 to 10 years of experience with mean $\pm$ SD 9.20$\pm$4.80.

**Table 2** illustrates that the overall mean score percentage of the CRM as perceived of the two groups was 40.54$\pm$16.89, while the highest mean score percentage (53.23$\pm$15.43) of CRM was in private hospitals compared to the governmental hospital (27.85$\pm$3.17). On the other hand, the highest mean score percentage of CRM domain as perceived by the governmental hospital nurses was related to the status of policies and procedures of CRM which equal 48.57$\pm$3.17and the highest mean score percentage of CRM domain as perceived by the private hospital nurses was related to the staff' knowledge and recognition of CRM which equal 65.23$\pm$14.25. In addition, the lowest mean score percentage of the CRM domain as perceived by the governmental hospital nurses was related to staff organizing of CRM (20.5$\pm$5.78) , while the lowest one among private hospital nurses belongs to the position of CRM domain (47.94$\pm$20.38). Notably, the results showed that private hospital nurses had higher scores in all domains of CRM than governmental hospital nurses.

**Table 3** reveals that the overall staff nurses perception of risk programs

occurrence in hospitals was moderate (56.76±33.50). However, staff nurses in private hospital perceived high mean score percentage (89.52±9.56) of risk programs.

**Table 4** illustrated that there was a high significant correlation between the overall CRM perception and its dimensions and risk management programs, in relation to staff recognition, staff organizing, risk management training, risk management position, and monitoring of risk where P <0.001.–**Table 5** clarifies that there were statistically significant differences between nurses' overall CRM and their age (P<0.05), their working units, educational qualification where P <0.001. On the other

hand, there were no statistically significant differences between nurses' overall CRM and their gender, years of experiences in the current working, marital status, and educational qualifications.

**Table 6** shows that nurses' perception to risk management program is not significantly different regarding sex, and years of experience in current position. On the other hand there were highly significant difference between risk management program and age, working unit, nurses working in medical units perceived the highest mean score percentage in relation to CRM programs other than surgical and intensive care units.

**Table (1): Distribution of the studied nurses according to their socio demographic data**

| Socio demographic data | Hospital | | | | Total (n = 300) | | Test of Sig. | p |
|---|---|---|---|---|---|---|---|---|
| | Governmental (n = 150) | | Private (n = 150) | | | | | |
| | No. | % | No. | % | No. | % | | |
| **Gender** | | | | | | | | |
| Male | 6 | 4.0 | 14 | 9.3 | 20 | 6.7 | $\chi^2$= 3.429 | 0.064 |
| Female | 144 | 96.0 | 136 | 90.7 | 280 | 93.3 | | |
| **Age (years)** | | | | | | | | |
| Less than 30 | 66 | 44.0 | 7 | 4.7 | 73 | 24.3 | | |
| From 30 to 40 | 10 | 6.7 | 66 | 44.0 | 76 | 25.3 | $\chi^2$= 90.149 | <0.001* |
| From 41 to 50 | 61 | 40.7 | 58 | 38.7 | 119 | 39.7 | | |
| More than 50 | 13 | 8.7 | 19 | 12.7 | 32 | 10.7 | | |
| Mean ±SD. | 36.64 ±10.83 | | 41.19 ±8.20 | | 38.92 ±9.86 | | t=4.105 | <0.001* |
| **Unit** | | | | | | | | |
| Medical | 51 | 34.0 | 54 | 36.0 | 105 | 35.0 | | |
| Surgical | 50 | 33.3 | 30 | 20.0 | 80 | 26.7 | $\chi^2$= 45.655* | <0.001* |
| Intensive care unit | 49 | 32.7 | 30 | 20.0 | 79 | 26.3 | | |
| Other unit | 0 | 0.0 | 36 | 24.0 | 36 | 12.0 | | |
| **Educational qualification** | | | | | | | | |
| Bachelor of Nursing | 30 | 20.0 | 87 | 58.0 | 117 | 39.0 | | |
| Technical health Institution diploma | 18 | 12.0 | 11 | 7.3 | 29 | 9.7 | $\chi^2$= 95.582* | <0.001* |
| Secondary Technical Nursing School diploma | 102 | 68.0 | 28 | 18.7 | 130 | 43.3 | | |
| Others | 0 | 0.0 | 24 | 16.0 | 24 | 8.0 | | |
| **Marital status** | | | | | | | | |
| Married | 89 | 59.3 | 114 | 76.0 | 203 | 67.7 | | |
| Single | 59 | 39.3 | 23 | 15.3 | 82 | 27.3 | $\chi^2$= 26.950 | <0.001* |
| Divorced | 0 | 0.0 | 0 | 0.0 | 0 | 0.0 | | |
| Widow | 2 | 1.3 | 13 | 8.7 | 15 | 5.0 | | |
| **Experience in current position (years)** | | | | | | | | |
| Less than 5 | 33 | 22.0 | 17 | 11.3 | 50 | 16.7 | $\chi^2$= | 0.046* |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| From 5 to l0 | 62 | 41.3 | 72 | 48.0 | 134 | 44.7 | 6.177* | |
| More than 10 | 55 | 36.7 | 61 | 40.7 | 116 | 38.7 | | |
| Mean ±SD. | 8.26 ±4.04 | | 10.15 ±5.30 | | 9.20 ±4.80 | | t=3.468* | 0.001* |

$\chi^2$: **Chi square test**                    **t: Student t-test**
p: p value for comparing between the studied hospitals        *: Statistically significant at $p \leq 0.05$

**Table (2): Distribution of the studied nurses according to their perception of clinical risk management .**

| Clinical risk management (CRM) | Hospital | | Total (n = 300) | Test of Sig. | p |
|---|---|---|---|---|---|
| | Governmental (n = 150) | Private (n = 150) | | | |
| **Staff recognition** | | | | | |
| Total mean Score | 16.08 ± 2.31 | 28.87 ± 4.56 | 22.48 ± 7.35 | t= 30.659* | <0.001* |
| Mean score percentage | 25.25 ± 7.22 | 65.23 ± 14.25 | 45.24 ± 22.98 | | |
| **Staff organizing** | | | | | |
| Total mean Score | 12.74 ± 1.62 | 20.62 ± 4.56 | 16.68 ± 5.22 | t= 19.935* | <0.001* |
| Mean score percentage | 20.5 ± 5.78 | 48.64 ± 16.29 | 34.57 ± 18.65 | | |
| **Policies and procedure** | | | | | |
| Total mean Score | 20.6 ± 2.0 | 21.45 ± 4.46 | 21.02 ± 3.47 | t= 2.123* | 0.035* |
| Mean score percentage | 48.57 ± 7.13 | 51.60 ± 15.92 | 50.08 ± 12.40 | | |
| **Risk management training** | | | | | |
| Total mean Score | 14.93 ± 1.67 | 23.99 ± 5.49 | 19.46 ± 6.08 | t= 19.337* | <0.001* |
| Mean score percentage | 21.67 ± 5.20 | 49.98 ± 17.16 | 35.82 ± 19.01 | | |
| **Risk management position** | | | | | |
| Total Score | 11.45 ± 1.82 | 17.51 ± 4.89 | 14.48 ± 4.77 | t= 14.221* | <0.001* |
| % Score | 22.69 ± 7.60 | 47.94 ± 20.38 | 35.32 ± 19.89 | | |
| **Monitoring of risk** | | | | | |
| Total mean Score | 19.33 ± 2.65 | 28.37 ± 7.07 | 23.85 ± 7.0 | t= 14.655* | <0.001* |
| Mean score percentage | 28.70 ± 7.37 | 53.81 ± 19.65 | 41.26 ± 19.43 | | |
| **Over all CRM** | | | | | |
| Total mean Score | 95.13 ± 5.70 | 140.8 ± 27.78 | 118.0 ± 30.40 | t= 19.729* | <0.001* |
| Mean score percentage | 27.85 ± 3.17 | 53.23 ± 15.43 | 40.54 ± 16.89 | | |

$\chi^2$: **Chi square test**                    **t: Student t-test**
p: p value for comparing between the studied hospitals
*: Statistically significant at $p \leq 0.05$

**Table (3): Distribution of the studied nurses according to their perception of the risk management program occurrence .**

| | Hospital | | Total (n = 300) | t | p |
|---|---|---|---|---|---|
| | Governmental (n = 150) | Private (n = 150) | | | |
| **Risk program** | | | | | |
| Total mean Score | 31.0 ±0.0 | 47.38 ±2.39 | 39.19 ±8.38 | 83.927* | <0.001* |
| Mean score percentage | 24.0 ±0.0 | 89.52 ±9.56 | 56.76 ±33.50 | | |

**t: Student t-test**

p: p value for comparing between the studied hospitals
*: Statistically significant at p ≤ 0.05

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**Table (4): Correlation between risk program of CRM and clinical risk management (CRM)**

| Clinical risk management (CRM) | Risk program of CRM | |
| --- | --- | --- |
| | Total Sample (n = 300) | |
| | r | p |
| **Staff recognition** | 0.875 | <0.001* |
| **Staff organizing** | 0.770 | <0.001* |
| **Policies and procedure** | 0.123 | 0.034* |
| **Risk management training** | 0.754 | <0.001* |
| **Risk management position** | 0.644 | <0.001* |
| **Monitoring of risk** | 0.643 | <0.001* |
| **Overall// dep** | 0.758 | <0.001* |

**r: Pearson coefficient**

*: Statistically significant at $p \leq 0.05$

**Table (5): Relationship between clinical risk management (CRM) as perceived by studied nurses and their socio democratic data**

| | Clinical Risk Management | | | | | | |
|---|---|---|---|---|---|---|---|
| | Staff recognition Mean %±SD | Staff organizing Mean %±SD | Policies and procedure Mean %±SD | Risk management training Mean %±SD | Risk management position Mean %±SD | Monitoring of risk Mean %±SD | Overall Mean % Score Mean %±SD |
| **Sex** | | | | | | | |
| Male | 53.59 ± 17.57 | 44.11 ± 16.84 | 51.96 ± 9.52 | 38.13 ± 10.52 | 37.08 ± 15.05 | 43.61 ± 12.81 | 44.92 ± 10.86 |
| Female | 44.64 ± 23.23 | 33.89 ± 18.61 | 49.95 ± 12.59 | 35.66 ± 19.48 | 35.19 ± 20.21 | 41.09 ± 19.83 | 40.23 ± 17.21 |
| t (p) | 2.148* (0.042*) | 2.386* 0(.018*) | 0.701 (0.484) | 0.940 (0.355) | 0.410 (0.682) | 0.813 (0.424) | 1.777 (0.087) |
| **Age (years)** | | | | | | | |
| Less than 30 | 31.04 ± 12.36 | 24.71 ± 10.34 | 49.36 ± 7.63 | 23.16 ± 9.82 | 22.55 ± 9.05 | 31.89 ± 9.16 | 30.54 ± 8.07 |
| From 30 to 40 | 61.10 ± 19.69 | 48.12 ± 19.97 | 50.09 ± 18.12 | 48.56 ± 21.39 | 44.35 ± 25.04 | 50.80 ± 22.50 | 50.85 ± 19.46 |
| From 41 to 50 | 44.41 ± 23.87 | 32.38 ± 17.33 | 50.87 ± 9.29 | 35.90 ± 17.72 | 37.85 ± 18.81 | 41.29 ± 18.28 | 40.53 ± 15.73 |
| More than 50 | 43.07 ± 23.06 | 33.04 ± 17.24 | 48.77 ± 14.87 | 34.18 ± 13.45 | 33.59 ± 12.20 | 39.84 ± 22.77 | 38.91 ± 15.61 |
| F (p) | 27.165* (<0.001*) | 26.034* (<0.001*) | 0.358 (0.783) | 28.369* (<0.001*) | 18.848* (<0.001*) | 13.286* (<0.001*) | 21.846* (<0.001*) |
| **Unit** | | | | | | | |
| Medical | 46.10 ± 25.35 | 36.12 ± 20.67 | 49.22 ± 9.23 | 36.61 ± 19.33 | 36.23 ± 19.61 | 41.01 ± 17.31 | 41.01 ± 17.0 |
| Surgical | 38.20 ± 16.88 | 25.89 ± 11.71 | 48.04 ± 14.46 | 28.44 ± 13.33 | 30.89 ± 17.56 | 36.91 ± 16.24 | 34.85 ± 13.31 |
| Intensive care unit | 40.90 ± 22.51 | 31.42 ± 14.44 | 48.82 ± 11.22 | 30.58 ± 14.09 | 27.43 ± 12.19 | 32.84 ± 12.88 | 35.41 ± 11.76 |
| Other unit | 67.88 ± 11.97 | 56.25 ± 15.54 | 59.92 ± 13.93 | 61.46 ± 16.40 | 59.84 ± 20.07 | 70.14 ± 17.60 | 63.07 ± 14.60 |
| F (p) | 17.672* (<0.001*) | 29.591* (<0.001*) | 9.455* (<0.001*) | 38.389* (<0.001*) | 30.923* (<0.001*) | 48.369* (<0.001*) | 36.362* (<0.001*) |
| **Educational qualification** | | | | | | | |
| BSC | 52.91 ± 19.50 | 40.90 ± 14.26 | 51.56 ± 11.83 | 41.08 ± 14.35 | 39.35 ± 15.84 | 45.70 ± 16.70 | 45.48 ± 12.96 |
| Technical health institute diploma | 45.37 ± 28.56 | 35.10 ± 27.73 | 59.48 ± 12.23 | 42.67 ± 27.92 | 43.82 ± 31.76 | 44.44 ± 33.26 | 45.10 ± 26.32 |
| Secondary nursing school diploma | 34.62 ± 19.35 | 27.91 ± 16.62 | 48.19 ± 7.68 | 27.28 ± 14.51 | 27.44 ± 14.75 | 35.41 ± 13.79 | 33.58 ± 12.76 |
| Others | 65.23 ± 22.33 | 39.14 ± 23.06 | 41.82 ± 23.82 | 48.18 ± 27.55 | 48.09 ± 27.06 | 47.45 ± 27.26 | 48.66 ± 24.72 |
| F (p) | 24.257* (<0.001*) | 11.635* (<0.001*) | 11.827* (<0.001*) | 19.379* (<0.001*) | 15.427* (<0.001*) | 7.503* (<0.001*) | 15.121* (<0.001*) |
| **Social** | | | | | | | |
| Married | 47.24 ± 23.08 | 36.01 ± 18.62 | 49.30 ± 13.15 | 36.88 ± 18.87 | 36.74 ± 20.12 | 41.95 ± 20.38 | 41.52 ± 17.10 |
| Single | 37.92 ± 21.79 | 29.83 ± 18.30 | 53.14 ± 7.52 | 32.70 ± 20.12 | 31.76 ± 20.18 | 39.13 ± 16.38 | 37.52 ± 16.21 |
| Divorced | – | – | – | – | – | – | – |
| Widow | 58.13 ± 17.19 | 40.95 ± 16.74 | 44.05 ± 19.03 | 38.54 ± 12.37 | 35.56 ± 12.29 | 43.52 ± 21.99 | 43.85 ± 16.52 |
| F (p) | 7.615* (0.001*) | 4.221* (0.016*) | 4.786* (0.009*) | 1.584(0.207) | 1.844 (0.160) | 0.724 (0.486) | 1.951 (0.144) |
| **Experience in current position (years)** | | | | | | | |
| Less than 5 | 41.56 ± 25.18 | 36.0 ± 18.01 | 53.14 ± 7.24 | 35.13 ± 20.58 | 29.33 ± 19.31 | 40.11 ± 16.19 | 39.43 ± 16.46 |
| From 5 to l0 | 45.71 ± 22.10 | 35.55 ± 20.75 | 49.17 ± 15.06 | 37.24 ± 22.12 | 37.53 ± 21.22 | 42.60 ± 22.56 | 41.45 ± 19.03 |
| More than 10 | 46.28 ± 23.03 | 32.82 ± 16.21 | 49.82 ± 10.50 | 34.48 ± 13.74 | 35.34 ± 18.10 | 40.21 ± 16.67 | 39.97 ± 14.34 |
| F (p) | 0.786 (0.456) | 0.844 (0.431) | 1.920 (0.148) | 0.695 (0.500) | 3.137* (0.045*) | 0.575 (0.563) | 0.368 (0.693) |

**t: Student t-test                    F: F for ANOVA test**

p: p value for association between the studied categories

*: Statistically significant at p ≤ 0.05

**Table (6): Relationship between risk management programs  as perceived by studied nurses and  their socio democratic data.**

| | Risk program of CRM Mean %±SD | Test of Sig. | p |
|---|---|---|---|
| **Sex** | | | |
| Male | 68.20 ± 33.28 | t= | |
| Female | 55.94 ± 33.43 | 1.591 | 0.126 |
| **Age (years)** | | | |
| Less than 30 | 28.66 ± 17.30 | | |
| From 30 to 40 | 81.21 ± 23.75 | F= | <0.001* |
| From 41 to 50 | 56.71 ± 33.70 | 44.515* | |
| More than 50 | 63.00 ± 32.81 | | |
| **Unit** | | | |
| Medical | 56.61 ± 33.74 | | |
| Surgical | 49.00 ± 32.50 | F= | <0.001* |
| Intensive care unit | 49.62 ± 32.96 | 16.825* | |
| Other unit | 90.11 ± 2.03 | | |
| **Educational qualification** | | | |
| BSC | 73.44 ± 29.84 | | |
| Associate degree | 48.83 ± 32.34 | F= | <0.001* |
| Diplom | 37.32  ±26.76 | 48.455* | |
| Others | 90.33 ± 2.01 | | |
| **Social** | | | |
| Married | 61.10 ± 33.55 | | |
| Single | 41.51 ± 29.11 | F= | <0.001* |
| Divorced | – | 15.627* | |
| Widow | 81.33 ± 23.36 | | |
| **Experience in current position (years)** | | | |
| Less than 5 | 47.12 ± 32.54 | | |
| From 5 to l0 | 59.01 ± 33.63 | F= | 0.082 |
| More than 10 | 58.31 ± 33.32 | 2.523 | |

**t: Student t-test          F: F for ANOVA test**
p: p value for association between the studied categories
*: Statistically significant at $p \leq 0.05$

**Discussion**

Clinical Risk management is considered as the most relevant aspects of quality & patient safety in health care setting, and it is better to perform comprehensive analysis in identifying the root causes of adverse events in hospitals and uncover the most important risk programs that enhance and promote clinical risk management in the hospital. In this study, the goal was to identify the perception of the current practices in hospitals with respect to clinical risk management and its relation to the occurrence of risk programs.

This findings in the current study depicted that the majority of the studied nurses had perceived a moderate level of CRM in their hospitals as well as its domains; staff recognition of CRM, staff organizing, policies and procedure, risk management training, risk management position, and monitoring of risk .This result is sensible due to the graduated nursing students were not equipped with the specific subject in main educational curricula about Clinical risk management. Also, it is recognized that nursing practice license was not frequently updated due to lack of laws that obligate nurses either to update their license continuously or to attend training about clinical risk

management. Furthermore, the training activities in this field were very superficial and minimal in number for both private and governmental hospitals and the nurse managers' bias in nomination of the staff for training and workshops, as reported by the study participants.

In the same line , the results of researches by **Bagherpour, Yarahmadi, & Khademian**, **(2015) & Mehrdad Azarbarzin et al., (2016),** showed that the risk management status is moderate in hospitals as well as moderate perception of nurse awareness about CRM. Also, **Zaboli et al., 2011** and **Farokhzadian et al., 2018** indicated that implementing and developing domains of CRM ranged from poor to moderate · In addition, **Zaboli et al 2011** revealed that the status of knowledge about risk management in hospitals, policies and procedures, the position of risk management in the hospital and the status of monitoring the risk analysis, assessment and control are all evaluated to be at a moderate level.

Moreover, the current study is in harmony with **Vincent, et al., 2001** who approved that the causes of immature clinical risk management are related to lack of knowledge or experience of the staff, inconsistent policies, funding problems, lacking senior management procedure for risk reduction, poor communication between the staff. Aligned with **Adibi et al., 2012** claimed that a 4 week training program on safety significantly improved judgment and understanding of nurses, and as a result, they adhered more strictly to safety measures. While, **Verbano  et al., 2010** concluded that the patient safety culture should be developed based on clinical governance policy and programs, comprehensive and short courses for risk management training, and implementation of clinical risk

management. Furthermore **Adibi et al., 2012** revealed that the dimension of teamwork within hospital units had the highest percentage in patient safety.

Also, **Adeleke et al 2018** found that organizational polices, rules and regulations support risk management. Moreover, **Mekasha,2011** explained that top management support, communication, organizational structure, staff training appropriately are critical success factors for effective risk management activities.

On the other side , two studies were inconsistent with the current  study findings,   the first in Iran   done by **Farokhzadian et al.,2020** who indicated that CRM initiatives often find difficulties and have not been successfully implemented in hospitals which leads to occurrence of  injuries caused by clinical hazards and lack of healthcare personnel, involvement in risk management. The second study  by **Rabechini and Morteiro (2013)** revealed that risk management activities , tools and techniques were very low in hospitals. Also **Jafari et al , 2018** found that nurses' viewpoints of CRM were fairly low.

It is widely accepted that successful CRM prospective among healthcare providers depends on two things: the acquisition of CRM information and the translation of that information into practice, and  the integration of healthcare providers depends on the organizational systems and processes **(Kohn et al.,1999)** which were parallel with this study results , showed that private hospital nurses had higher scores in overall CRM as well as its dimensions than governmental hospital nurses. This is due to the presence of governance control at private hospitals, also it had  a system of management that supports patient safety and risk

management, had a staff development training unit that provides training in all nursing fields especially for patient safety, and well developed policies and guidelines published in all hospital units.

This results goes in the same line with the **Coble et al., 2010** clarified that public sector participants had more problems in implementing risk management programs than the private sector when dealing with risks that had politically controversial implications. Also**, Fone and Young, 2000; McPhee, 2005**) suggested that the public sector risk management is distinct and different from the private sector risk management.

Furthermore, **Ahmeti et al 2017** claimed that the institutions in the public sector are very difficult in providing any incentive towards risk management in this sector . also, they, also revealed that the public sector was not well equipped or willing to deal with many clinical risks in organization, which supported the results of the current study. In contrast with the current result of this study , **Spira & Page, 2003** suggest that there is no material difference between the private and public sectors when it comes to risk management.

Notably, the current study revealed that the nurse perception toward clinical risk management policies and regulation was the highest perceived dimension while the staff organizing had the lowest perceived dimension in the total study sample. This may be due to increasing the interest of the MOHP for the presence of this policy in hospitals; they also enforce the manager to publish and communicate this policy to the staff. In addition to the presence of this policy in each unit, and the continuous audit from the MOHP for the presence of thier policies. This result is inconsistent with a study done in Italy (**Verban and Tera 2010**) which revealed

that in all the cases analyzed they observed a deficiency in the activities, methodologies and managerial policies specifically oriented towards the human factors of risk management.

In relation to the current study results, the level of perception of CRM organizing, the management policies and procedures, and CRM training were moderate. It may be evident that educational programs and activities of mangers regarding the preparation and availability of the regulations and rules of CRM are at a very low level in hospital contexts. In essence, a study was conducted in Iran in which there was no compliance with CRM requirements in the different wards of the hospital **Yarahmadi, 2009**.In the same line the results of **Farokhzadian et al 2015** mentioned that among the six domains of CRM system, the highest mean belonged to the domain of the monitoring of analysis, evaluation and risk control $(3.18\pm0.72)$; the lowest mean belonged to the domain of the staff's knowledge, recognition and understanding of CRM $(2.93\pm0.66)$. There were no integrated electronic systems for recording and analyzing clinical risks and incidents in the hospitals.

Recognition of risk is a critical stage in the development of CRM, and it depends on maintaining a culture of honesty, trust, integrity, and open communication among patients, families, and healthcare providers **(Neale, 1997).**The results of this study showed that the staff's knowledge, understanding and recognition of CRM were poor. This may be related to the absence of the nursing staff's participation in developing CRM, such as reporting and analysis. Which is consistent with **Adibi et al., 2012** who said that the hospital managers should focus on learning different aspects of CRM, encouraging all healthcare providers to do the same, and building a

culture in which patients' safety is a top priority.

As regards the presence of risk management programs, it was evidenced in the total number of studied hospitals .However, the majority of CRM programs was found more in private hospitals than in governmental hospitals. This may be attributed to the occurrence of most of these programs except for the risk manager existence and electronic system for medication request programs. While in Governmental hospitals, limited risk programs were present such as the risk management committee and team, the quality improvement committee, team and office, the patient safety committee and team, the staff and patient safety officer, and program of nosocomial infections control. This result is supported by Abdi, Maleki, & Khosravi, 2011 who found risk management programs in governmental teaching hospital were not in good condition .

In the same vein, other researchers such as Farokhzadian et al 2015 and Sheikhtaheri et al 2013 found that there were no national, electronic systems, such as Patient Safety Information Systems (PSIS), for recording and analyzing incidents. There are two national safety programs, i.e., the control of nosocomial infections and a reporting system for adverse drug reactions (ADRs).

Moreover, This study depicted that there was a significant correlation between the overall CRM and its dimensions and program of CRM in relation to staff recognition, staff organizing ,risk management training, risk management position, monitoring of risk ,and policies and procedure of CRM. This result may be related to the presence of risk programs such as the risk management committee, the risk manager, the educational program & culture

building, the reporting system etc.. Risk management programs support staff recognition, and organizing of CRM, enhance training , policies and procedures of CRM which help in identifying adverse events, resulting in early warning systems , reducing clinical errors and adverse events which lead to successful and effective CRM in hospital. This result goes in the same line with Patanakul, 2008 who found positive relation between the risk program and the risk management and recommended a strong integration between them for successful CRM. Also, Raz and Michael (2001) suggested a list of risk management programs that are widely used and are associated with effective risk management.

Furthermore, this study results showed that there was a statistically significant difference between the level of clinical risk management in relationship to their the educational level and, in which nurses graduating from BCs and having master degrees had higher perception of CRM than others. In agreement with the results of this study ,Johnstone and Kanitsaki, 2006 concluded that there was a relationship between nurses' educational level and CRM. Furthermore, Aiken et al., 2003 claimed that there is a direct correlation between the baccalaureate and other higher education of hospital nurses and lower morbidity and mortality rates among surgical patients, and that 'good' nurse education makes a difference. Contrary to this study result, Zaboli et al 2011demonstrated that there was no significant relationship between the total score of risk management and education (p>0 005). Also a study done in Italy was inconsistent with this study which explained that graduate nurses still have not the acquired pertinent information about CRM processes in health care.

**Conclusion:**

This study concluded that the nurses in the private and governmental hospitals have moderate to poor levels of clinical risk management perception, and there is significant positive association between the occurrence of risk programs and clinical risk management. Also, staff nurses in private hospital had higher perception of CRM and risk programs than those in governmental hospital.

## Recommendation:

This study recommended to develop and implement of   training programs for nurses to improve their competency related to CRM, also developing CRM guidelines to be published in all hospital units. In addition, sending electronic Emails to all health team about CRM activities to increase their recognition and knowledge regarding CRM. Conducting periodical meetings with all nurses and physicians in an interdisciplinary approach to establish mutual trust and willingness to report clinical medical and nursing errors in all areas of health care. Researchers suggest additional quantitative and qualitative research to assess and continuously monitor the elements of CRM and to compare and exchange information among the various hospitals using FEMIA tools. Develop a health information system that establishes effective and electronic reporting and documentation of errors

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