Relationship between Nurses' Risk Management and Safety Culture

Somia Mohamed AbdelAziz[1] Sahar Mohamed Morsy[2] & Amal Sayed Mohamed[3]

[1.] Assistant Lecturer of Nursing Administration Department, Faculty of Nursing, Assuit University, Egypt.

[2.] Professor of Nursing Administration, Faculty of Nursing, Assiut University, Egypt.

[3.] Assistant Professor of Nursing Administration, Faculty of Nursing, Assiut University, Egypt.

Abstract:
Introduction: Enhancing risk management is crucial for cultivating a strong safety culture among nurses. It improves patient care while promoting the well-being of nursing staff, ultimately contributing to a more efficient and robust healthcare system. **Aim:** Assess the relationship between nurses' risk management and safety culture. **Study design:** descriptive correlational research design was used. **Setting:** The study was conducted at Main Hospital-Assiut University at (General Internal Medicine & General Surgical) Units. **Subject and Method:** The study subject consists of 42 nurses. The data collected through **First tool;** Structured self-administered questionnaire sheet including:-**a):** Personal data sheet. **b):** AGRASS Questionnaire (Accept Group, Reduce, Avoid, Share, and Select the risk) to assess the risk management in health care setting. **Second tool;** questionnaire for Hospital Survey on Patient Safety Culture (HSOPSC) to assess levels of safety culture by nurses. **Results**: The majority of nurses had unsatisfactory risk management score and more than half of them had low safety culture level **(83.3% & 57.1%)** respectively. **Conclusion:** There were statistical significant relationship between risk management and safety culture **(0.014*)** .**Recommendation:** Develop and implement continues educational programs and seminars on risk management and safety culture for nurses.

Keywords: Risk Management, Safety Culture &Nurses.

Introduction

Healthcare providers and nursing service administration plays a crucial role in equipping professional agents with the components of a risk management plan. The primary objective of this plan is to safeguard patients, staff, and visitors from unintentional harm **(Alanazi et al., 2022)**. Risk management in healthcare systems involves a combination of clinical and administrative activities, care procedures, and reporting mechanisms to handle potential risks. By adopting proactive risk management strategies, healthcare organizations can effectively protect patient safety, preserve their assets, maintain their local market presence, ensure compliance with accreditation standards, secure reimbursement rates, enhance brand reputation, and uphold their standing within the community **(Anozie et al., 2024).**

Risk management in healthcare involves identifying environments and situations that cause potential harm to patients and staff, as well as implementing measures to prevent these risks. This approach enhances the quality care and fosters a culture of safety within healthcare services**.** Risk management in hospitals is essential for safeguarding patient safety and enhancing healthcare results. It includes recognizing, evaluating, and prioritizing risks to minimize the chances of negative outcomes **(Çayırtepe & Şenel 2022)**.

Guo & Lv (2024) define risk management for healthcare organization is a structured approach aimed at identifying, evaluating, and mitigating risks that could affect patients, visitors, staff, and organizational resources. The most effective risk management involves a proactive strategy for identifying, preventing, and handling potential risks.

Risk management phases as identified by **Niv & Tal (2024)** including: **1) Risk Identification:** Detecting potential hazards that could affect patient safety, such as medical errors, equipment failures, or infection control issues, **2) Risk Assessment:** Evaluating the potential impact and likelihood of identified risks to prioritize which ones need the most attention, **3) Risk Control:** Implementing strategies to mitigate or eliminate risks, such as training staff, improving procedures, or upgrading equipment, and **4) Monitoring and Review:** Continuously monitoring risk management practices and reviewing them to ensure they remain effective and relevant. **Mistri, et. al., (2023)** Applying risk management in hospitals significantly enhances nurses' safety culture by fostering a proactive approach to identifying and mitigating potential hazards, also this promotes a culture of accountability and shared responsibility, encouraging nurses to prioritize both their own safety and patient care. Imagine safety culture as a grand palace, standing strong on the pillars of commitment,

awareness, and responsibility. Just as a palace provides shelter and security for its inhabitants, a strong safety culture protects employees, ensuring a safe and healthy work environment **(Orikpete& Ewim 2024)**.

Mistri, et al., (2023) define safety culture in hospitals as shared values, beliefs, and practices that prioritize patient safety and ensure the minimization of risks and harm to patients during the provision of healthcare. It is a key aspect of healthcare management and quality improvement, focusing on creating an environment where safety is embedded in every activity. Another definition of safety culture refers to the collective practices and beliefs shared among an organization's employees, aimed at managing the key risks associated with its operations **(Naji, et al., 2021)**.

Lee & Dahinten (2021) mentioned that patient safety culture reflects how much an organization's culture encourages and enhances patient safety. It encompasses the shared values, beliefs, and norms among healthcare workers and staff that shape their actions and behaviors. This culture can be assessed by evaluating the values, beliefs, norms, and behaviors concerning patient safety that are recognized, supported, anticipated, and embraced within the organization. Additionally, it is essential to recognize that culture operates at various levels, from individual units to departments, the entire organization, and broader systems.

Core components of a robust safety culture encompass leadership commitment to safety, teamwork, transparency, and ongoing training. It involves not just medical professionals but also administrative and support staff, recognizing that safety is everyone's responsibility. The ultimate goal is to enhance patient outcomes, reduce medical errors, and foster trust between patients and healthcare providers **(Huang, et al., 2024)**.

A strong safety culture fosters an environment where healthcare providers can excel in their roles, leading to enhanced performance and better patient care outcomes. When safety protocols are effectively implemented and followed, the risk of errors and adverse events decreases significantly. This not only protects the physical well-being of both patients and staff but also promotes a sense of psychological security. Consequently, employees are more inclined to be fully involved in their responsibilities, knowing they are supported by a system that prioritizes their safety. High safety standards ultimately create a positive feedback loop, reinforcing safe practices and reducing the likelihood of negative incidents **(Tenza et al., 2022)**.

Significance of the study

Nurses play a critical role in identifying and managing risks, making their insights invaluable for developing effective strategies. By examining risk management among nurses, the study can uncover challenges, promote evidence-based interventions, and support the creation of safer hospital environments. Additionally, it contributes to reducing errors and costs while improving compliance with healthcare standards and supporting nurses' well-being, ultimately leading to better patient outcomes. Many studies have been published in academic articles and journals nationally and internationally about risk management such as Developing risk management policies for healthcare providers at Critical Care Units done by **Haggag, et al (2022)**, Occupational health risks of barbers: knowledge, practices, and self-reported symptoms done by **Farouk& Awadin (2021)**, Clinical risk management in healthcare organizations perceived by staff nurses done by **Leithy & Mohamed (2021),** and Evaluation of risk management from the perspective of hospital nurses in Shahid Rahnemon Hospital done by **Zarezade, et al (2013)**. There is any attempt to assess risk management and safety culture at Upper Egypt; this was the motives for the researchers to conduct this study.

Aim of the study

The present study aims to:

Assess the relationship between risk management and safety culture among nurses at Main Hospital- Assiut University.

Research question:

Q1: What are nurses' risk management score?

Q2: What are nurses' safety culture levels?

Q3: Is there relationship between risk management and safety culture among nurses?

Subject and Method

The study used four design throughout the research phases which were technical, administrative, operational, and statistical design.

Technical design

This design was involved the study design, where the research will be conducted, and what are the subject and questionnaire of data collection.

Study design

A descriptive correlational design was used.

Setting

The current study was carried at Main Hospital- Assiut University at General Internal Medicine (female and male internal medicine unit) and General Surgery Unit.

Subject

Total number of studied nurses = 42 nurse. This sample was chosen using simple random sample and

calculated using G Power Software 3.1.9.7 with an effect size (f) = 0.57, α error of 0.05, and an actual power (1- β) =0.95.

Data collection tools: two tools were used in the present study:

Tool I: Structured self-administered questionnaire sheet which consists of two parts:-

Part (1): A personal data sheet, which included data about: gender, age, unit name, years of experience, educational qualifications and marital status.

Part (2): AGRASS Questionnaire (Accept Group, Reduce, Avoid, Share, and Select the risk) which was developed by **A Gama, et al (2020)** and modified by the researchers to assess the risk management in health care setting. It consists of 40 items under two dimensions **I- structure dimension of risk management** which consists of 12 items under four domains **1) awareness** includes (2 items), **2) accountability** includes (3 items), 3) **ability** includes (4 items) and **4) safety culture** includes (3 items). **II Process dimension of risk management** which consists of 28 items under five domains **1) risk identification** includes (13 items), 2) **risk assessment analysis** includes (4 items), 3**) risk treatment includes** (3 items), 4) **risk communication includes** (5 items) **and 5) integration of risk assessment process** includes (3 items).

Scoring system:

Participants were responding for all questionnaire items either, by yes which equal (2) or no which equal (1). All participants ' responses were summed up and ranged from (40-80). If the participant obtained total score from 40 to 60 it means that he/she had unsatisfactory risk management score. If the participant obtained total score from 61 to 80 it means that he/she had satisfactory risk management score.

Tool (II): The Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire which was developed by **Sorra et al., (2016)** to assess levels of safety culture by nurses**.** It consists of (42) items for measuring (12) dimensions of safety culture: **1) Teamwork within units** includes (4 items), **2) Organizational learning and continuous improvement** includes (3 items), **3) Overall perception of patient safety** includes (4 items), **Staffing** includes (4 items) , **4) Nonpunitive response to errors** includes (3 items), **5) Supervisor/manager expectations & actions promoting patient safety** (4 items), **6) Feedback and communication about erro**r includes (3 items), **7) Communication openness** includes (3 items) , **8) Frequency of events reported** includes (3 items), **9) Management support for patient safety** includes (3 items), **10) Teamwork across units** includes (4

items) , and **11) Handoffs and transitions** includes (4 items).

Scoring system:

The nurse's respond to 3-points Likert scale, ranged from disagree which equal (1), neutral which equal (2), and agree which equal (3). The total scores for 42 items were summed up for each nurse and if the participant obtained from:

- 42 to 63 it means that nurse had low level of safety culture.
- 64 to 105 it means that nurse had moderate level of safety culture.
- 106 to 126 it means that nurse had high level of safety culture.

Administrative design

Official letter from the Dean of Faculty of Nursing-Assiut University, Hospital director, and Nursing Director of Main Hospital-Assiut University to be able to collect the necessary data for the pilot study and then to collect the necessary data for the present study.

Ethical considerations

Research proposal was approved from Ethical Committee at the Faculty of Nursing, Assiut University, there was no risk for nurses during application of the research steps, the study was followed common ethical principles in clinical research, oral and written agreement were obtained from nurses participated in the research, nurses have the rights to refuse or to participate and/or withdraw from the study without any rational at any time, confidentiality and anonymity was assured during collection of data.

Operational design

Preparatory phase:

After reviewing the available literature concerning the topic of the study, Arabic translation of the study tool was done; it took about three months from the beginning of May to the end of July 2023.

Validity: The face validity of the study tool and the Arabic translation were evaluated by a panel of seven experts specializing in nursing administration, (4 professors and 3assistant professors).

A pilot study

A pilot study was carried out to assess tool clarity, understandability, and applicability of the research tools. Additionally, to identify problems that might be encountered during the actual data collection. It applied on (10%) from total sample (42) nurses from surgical and medical units and conducted through a week from 20- 27/7/ 2023. Data collected from the pilot study was analyzed and no changes were done for the study tools, thus the nurses who share in the pilot study were included in the study pilot**.**

The study tools were tested for its reliability by using Crombach's Alpha Co- efficient test, it was efficient

and test, it **was (a= 0.883)** for AGRASS Questionnaire (Accept, Group, Reduce, Avoid, Share, and Select the risk), and **(a= 0.819)** for The Hospital Survey on Patient Safety Culture (HSOPSC) questionnaire. This suggests that the study tools have high degree of reliability.

Field work

After ensuring the clarity and understandability of the study tools, the actual data collection was started in August 2023 by the researcher through distributing questionnaire form for nurses. The researcher constructs meeting with every nurse in her/his departments at Main Hospital-Assiut University and explained the purpose of the study. Then they filled the questionnaire form. Each nurse took about half an hour to fulfill the questionnaire. The whole duration to collect data was about two months.

Statistical design

Data entry and statistical analysis were done using SPSS (Statistical software Package for Social Science) version 22. The data were shown as numbers, percentages, mean, and standard deviation. An independent samples t-test was applied to compare quantitative variables between groups. Pearson correlation was used to assess the relationship between quantitative variables. A p-value of ≤ 0.05 was considered statistically significant. R-value was used to indicate negative or positive relation.

Results

Table (1): Distribution of personal data of nurses working at Main Hospital-Assiut University (no=42)

Personal data	No. (42)	%
Gender:		
Male	11	26.2%
Female	31	**73.8%**
Age: (years)		
< 30	11	26.2%
30 – 40	21	**50.0%**
> 40	10	23.8%
Mean ± SD (Range)	35.52 ± 9.00 (21.0-57.0)	
Years of experience:		
< 10	11	26.2%
10 – 20	18	**42.9%**
> 20	13	31.0%
Mean ± SD (Range)	15.74 ± 9.60 (1.0-37.0)	
Educational qualification:		
Secondary Nursing School	21	**50.0%**
Technical institute for nursing	21	50.0%
Marital status:		
Single	12	28.6%
Ever married	30	**71.4%**

Table (2): Mean score of risk management dimensions as reported by nurses working at Main Hospital-Assiut University (no=42).

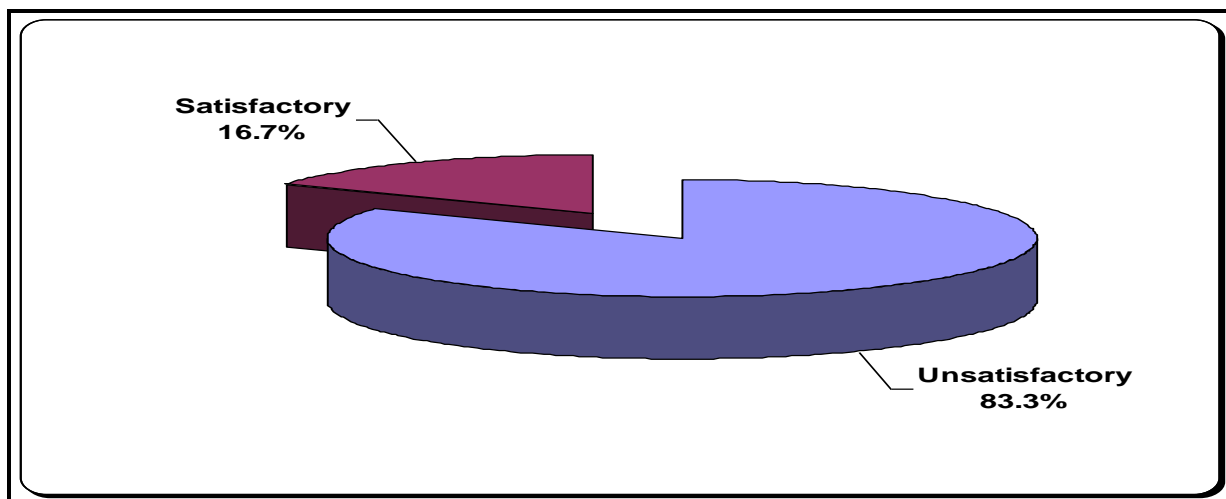| Risk Management Dimensions	Mean ± SD	Max. Score
Structure dimension of risk management	20.93 ± 2.86	28
Awareness	**3.26 ± 0.80**	4
Accountability	4.67 ± 0.98	6
Ability	8.38 ± 1.68	12
Safety culture	4.62 ± 1.10	6
Process dimension of risk management	49.38 ± 7.19	62
Risk identification	**25.07 ± 4.17**	32
Risk analysis	7.10 ± 1.34	8
Risk treatment	4.76 ± 1.05	6
Risk communication	7.64 ± 1.78	10
Integration of risk management process	4.81 ± 1.19	6
Total Risk management Dimensions	**70.31 ± 8.98**	90

Figure (1): Nurses' risk management score at Main Hospital-Assiut University (no=42)

Table (3): Mean score of safety culture dimensions as reported by nurses working at Main Hospital-Assiut University (no=42).

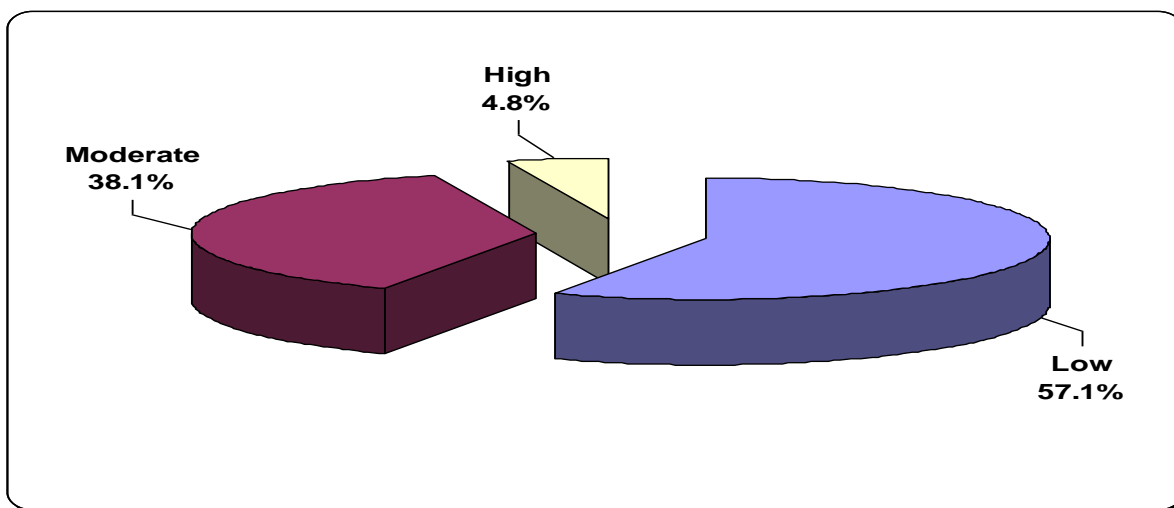| Safety culture Dimensions	Mean ± SD	Max. Score
Teamwork within units	**7.83 ± 1.75**	12
Organizational learning-continuous improvement	6.02 ± 1.49	9
Overall perceptions of patient safety	**7.21 ± 1.89**	9
Staffing	**7.36 ± 1.57**	12
Nonpunitive response to errors	6.12 ± 1.25	9
Supervisor/ manager expectations & actions promoting patient safety	**7.88 ± 1.70**	12
Feedback & communication about error	5.40 ± 1.58	9
Communication openness	5.74 ± 1.74	9
Frequency of incident reported	6.00 ± 1.51	9
Management support for patient safety	**4.79 ± 1.66**	9
Teamwork across units	**7.86 ± 1.70**	12
Hand offs and transitions	**7.81 ± 1.80**	12
Total Safety Culture s Dimensions	**80.02 ± 10.08**	126

Figure (2): Patient' Safety culture levels at Main Hospital-Assiut University (no=42).

Table (4): Correlation between risk management and safety culture at Main Hospital-Assiut University (no=42)

Safety culture dimensions	Risk Management score	
	r-value	**P-value**
Teamwork within units	**0.590**	**0.007***
Organizational learning-continuous improvement	**0.469**	**0.015***
Overall perceptions of patient safety	0.371	0.229
Staffing	**0.459**	**0.026***
Non-punitive response to errors	0.350	0.318
Supervisor/ manager expectations & actions promoting patient safety	0.366	0.290
Feedback & communication about error	**0.494**	**0.014***
Communication openness	**0.493**	**0.013***
Frequency of incident reported	**0.576**	**0.008***
Management support for patient safety	**0.448**	**0.027***
Teamwork across units	**0.508**	**0.011***
Hand offs and transitions	**0.523**	**0.009***
safety culture score	**0.471**	**0.014***

Table (1): Shows that the majority of nurses are female **(73.8%),** half of them aged from (30-40) years old and having Technical Institute for Nursing Diploma **(50%).** Less than half of nurses having experience from (10-20) years **(42.9%)** and more than two thirds of them are ever married **(71.4%).**

Table (2): Illustrates that the highest mean score regarding to risk management dimensions is related to risk identification domain **(25.07 ± 4.17)** and the lowest mean score is related to awareness domain **(3.26 ± 0.80)** with total mean score of risk management dimensions **(70.31 ± 8.98).**

Figure (1): Shows that the majority of nurses had unsatisfactory risk management score **(83.3%).**

Table (3): Illustrates that the highest mean score regarding to safety culture dimensions is related to teamwork within units, overall perceptions of patient safety, staffing, supervisor/ manager expectations & actions promoting patient safety, teamwork across units, and hand offs and transitions **(7.83 ± 1.75, 7.21 ± 1.89, 7.36 ± 1.57, 7.88 ± 1.70, 7.86 ± 1.70, and 7.81 ± 1.80)** respectively and the lowest mean score is related to management support for patient safety **(4.79 ± 1.66)** with total mean score of safety culture dimensions **(80.02 ± 10.08).**

Figure (2): Shows that more than half of nurses had low safety culture level **(57.1%).**

Table (4): Reveals that there are highly positive correlation with statistical significance relation between risk management and safety culture **(0.014*).**

Discussion

Park & Sharp (2019) mentioned that nurses are integral to risk management in hospitals due to their close interaction with patients, hands-on care, and involvement in every step of the healthcare delivery process. Their ability to identify risks early, advocate for patient safety, implement safety protocols, and educate others makes them essential in maintaining a safe and effective healthcare environment. By embracing their role in risk management, nurses help ensure that hospitals provide high-quality care while minimizing harm and enhancing patient outcomes.

The present study focused on assessing the relationship between nurses' risk management and safety culture.

This achieved through studying 42 of nurses working in at Main Hospital-Assiut University and the majority of nurses are female, half of them aged (30-40) years old and having Technical Institute for Nursing Diploma. Less than half of nurses having experience from (10-20) years and more than two thirds of them are ever married **(table, 1).** This might be attributed to the combination of a predominantly female workforce, a significant number of experienced nurses, and varied educational backgrounds provides opportunities for targeted professional development initiatives.

As revealed from the current study, the highest mean score regarding to risk management dimensions was related to risk identification domain and the lowest mean score is related to awareness domain **(table, 2)**. This might be attributed to that the hospital prioritize identifying risks effectively within their risk management frameworks, as evidenced by the higher score in this specific area compared to other dimensions, highlighting the importance of risk identification as a foundational element in effective risk management strategies. While the lowest mean score is related to awareness domain, this might be attributed to nurses need more awareness regarding risk management through training program.

These results were congruent with **Thangeda & Coleman., (2020)** who mentioned that proactive measures, including robust risk identification practices, can significantly enhance overall risk management in hospitals. Also this finding aligns with the study done by **(Ow Yong, et al., 2020)** who emphasizes the importance of risk identification in healthcare settings. For instance, effective risk management frameworks are essential for mitigating threats and ensuring patient's safety, particularly in complex processes such as medication administration and emergency response mechanism. Additionally the result aligns with the study conducted by **(Faruque, et al., 2024)** who indicates that training programs focused on risk awareness can significantly enhance overall risk management outcomes.

Based on the results of the present study, the majority of nurses had unsatisfactory risk management score **(fig, 1)**. This could be due to nurses lacking sufficient knowledge of risk management, which prevents them from identifying and addressing risks proactively.

These finding was consistent with **Goodman, et al., (2017)** who found there was a recognized need for improved nurses' awareness regarding risk management guidelines, which can further enhance risk management practices among nurses. The result goes in the same line with a study of evaluating risk management in educational hospitals done by **(Mohammadpour, et al., 2023)** who found that healthcare organizations face high risks, underscoring the importance of effective risk management programs. The findings indicated that there is often a lack of adequate knowledge and training for risk management, which aligns with the current study's observations about nurses' knowledge deficits.

As revealed from the current study, the highest mean score regarding to safety culture dimensions was related to teamwork within units, overall perceptions of patient safety, staffing, supervisor/ manager expectations & actions promoting patient safety, teamwork across units, and hand offs and transitions and the lowest mean score is related to Management support for patient safety **(table, 3).** This might be attributed to there are clear communication channel and effective leadership roles. Each of these dimensions contributes to creating an environment where patient's safety is prioritized, ultimately leading to better healthcare outcomes, while the lowest mean score is related to management support for patient safety might be attributed to organization doesn't provide adequate support for nurses and ineffective policy implementation to improve patient's safety outcomes.

These findings were congruent with **Kakemam & Sheikhy-Chaman (2020)** who emphasized the importance of management support in fostering a safe patient care environment. Nurses who perceived higher levels of management support were less likely to report experiencing adverse events.

These findings were consistent with the study done by **Ebrahimabadi, et. al., (2022)** who illustrated that the dimension of teamwork within units received high scores, indicating its critical role in fostering a positive safety culture. A study conducted in Saveh teaching hospitals reported that teamwork within units achieved a desirable score of 76%, marking it as the best-performing dimension among the 12 dimensions which evaluated.

These findings were congruent with the study conducted by **Brás, et. al., (2023)** who reported that the general perception of patient safety is fundamental to creating a culture that prioritizes safety. Research has shown that strong overall perceptions correlate with effective teamwork and communication practices within healthcare settings in addition to adequate staffing levels contribute positively to perceptions of safety, although this dimension often receives mixed evaluations depending on the healthcare context, finally Leadership plays a crucial role in shaping safety culture. Effective supervision and clear expectations from management have been linked to improve safety outcomes and staff engagement in safety practices management.

Additionally, these findings were congruent with the research done by **Shameela& Sulistiadi (2024)** who highlighted that teamwork is a critical component of a positive culture, as it fosters an environment where staff feel supported and empowered to report safety concerns.

These findings were also consistent with the study conducted by **Saputra, e t. al., (2024)** who mentioned that effective handoffs and transitions are vital for maintaining patient's safety during care transitions; this research indicates that this dimension requires ongoing attention, as it is frequently identified as areas which need improvement.

From the findings of the current study, more than half of nurses had low safety culture level **(fig. 2)**. This might be attributed to as a result of heavy workload and working long shift due to nurse's shortage, and nurses in the selected hospital not have sufficient awareness about safety culture.

These findings were consistent with **Mistri, et al., (2023)** who illustrated that that low safety culture levels are common among nursing staff, with contributing factors including high workload, insufficient training, and lack of support from management when studying the theses of enhancing patient safety culture in hospitals.

Also these findings were congruent with the study done by **Alabdullah & Karwowski (2024)** who

emphasize the necessity for training and education regarding patient safety and safety culture among nurses. Insufficient training can contribute to a lack of awareness and understanding, further perpetuating low safety culture levels within healthcare settings.

The findings of the current study demonstrated that, there are highly positive correlations with statistical significance relation between risk management and safety culture **(table, 4).** This might be attributed to fostering a strong safety culture through effective risk management; the hospital can enhance overall safety performance and the likelihood of incidents.

These findings were consistent with study done by **Kaya, (2019)** who examining the relationship between risk management and patient safety incidents in NHS England found that effective risk management strategies significantly reduce adverse events, thereby fostering a culture of safety within hospitals. This indicates that hospitals with robust risk management frameworks are likely to experience fewer safety incidents. Also these findings were congruent with the study done **by Abel, e t. al., (2023)** who found that effective risk management strategies are essential for improving patient's safety culture. The study reported that the overall perception of patient's safety culture was 72.1%, indicating room for improvement in risk management practices to bolster safety culture within healthcare setting.

Limitations of the study:

Nurses don't have time to fill out the questionnaire due to workload pressure so it took me more time.

Conclusion(s)
Based on the study results, the following conclusions can be made:
- The majority of nurses had unsatisfactory risk management score and more than half of them had low safety culture level.
- The highest mean score regarding to risk management dimensions is related to risk identification domain.
- The highest mean score regarding to safety culture dimensions is related to teamwork within units, overall perceptions of patient safety, staffing, supervisor/ manager expectations & actions promoting patient safety, teamwork across units, and hand offs and transitions.
- There is positive correlation between nurses' risk management and safety culture with statistical significant relation.

Recommendations
1- Develop and implement continues educational programs and workshops on risk management and safety culture for nurses at continuing training and education center.

2- Encourage open communication about risks and errors so foster culture of safety and reporting for your supervisor.
3- Monitor nurses 'awareness and performance regarding risk management by quality assurance committee.
4- Continues monitor safety culture and improve it, to protect patients, medical and nurses staff as a part of quality assurance activity in hospital.
5- Further research studies are needed to assess the effect of risk management training program on safety culture.

References
- **A Gama, Z., Saturno-Hernandez J., Caldas, A., Freitas, M., Mendonça D., Medeiros, C., & Soares, D. (2020):** AGRASS Questionnaire: Assessment of Risk Management in Health Care. Revista de saude publica, 54.
- **Abel, C., Oliver, E., & Folahanmi, A. (2023):** Assessing patient safety culture among healthcare professionals in Ibadan South-west region of Oyo State, Nigeria. Journal of Patient Safety and Risk Management, 28(3),116-125.https://doi.org/10.1177/25160435231172826
- **Alabdullah, H., & Karwowski, W. (2024):** Patient Safety Culture in Hospital Settings Across Continents: A Systematic Review. Applied Sciences, 14(18), 8496.
- **Alanazi, F., Sim, J., & Lapkin, S. (2022):** Systematic review: Nurses' safety attitudes and their impact on patient outcomes in acute-care hospitals. Nursing open, 9(1), 30-43. https://doi.org/10.1002/nop2.1063
- **Anozie, U., Adewumi, G., Obafunsho, O., Toromade, A., & Olaluwoye, O. (2024):** Leveraging advanced technologies in Supply Chain Risk Management (SCRM) to mitigate healthcare disruptions: A comprehensive review. World Journal of Advanced Research and Reviews, 23(1), 1039-1045.
- **Brás, C., Ferreira, M., Figueiredo, M., & Duarte, J. (**2023**):** Patient safety culture in nurses' clinical practice. Revista Latino-Americana de Enfermagem, 31, e3837. https://doi.org/10.1590/1518-8345.6231.3837
- **Çayırtepe, Z., & Şenel, A. (2022):** Risk Management In Intensive Care Units With Artificial Intelligence Technologies: Systematic Review of Prediction Models Using Electronic Health Records. Journal of Basic and Clinical Health Sciences, 6(3), 958-976.
- **Ebrahimabadi, M., Karimy, M., Poorcheraghi, H., Naseri Salahshoor, V., Fournier, A., & Abedi, A. (2022):** Perspectives of teaching hospitals' medical staff of the dimensions of patient safety

culture. 8(1), 15-22. DOI:10.32598/JCCNC.8.1.277.4

▪ **Farouk, S., & Awadin, L. (2021):** Occupational Health Risks of Barbers: Knowledge, Practices, and Self-Reported Symptoms. Egyptian Journal of Health Care, 12(2), 1562-1582.

▪ **Faruque, M., Khan, N., Chowdhury, S., Debnath, A., & Pranto, M. (2024):** The Effects of Organizational Commitment, Knowledge, Attitude, and Awareness on Risk Management Effectiveness in Labs. Educational Administration: Theory and Practice, 30(6),3100-3114. https://doi.org/10.53555/kuey.v30i6.5842

▪ **Goodman, L.., Estfan, B., Montero, A., Kunapareddy, G., Lau, J., Gallagher, E., & Stevenson, J. (2017):** Improving the management of patients with low-risk neutropenic fever at the Cleveland Clinic Taussig Cancer Institute. Journal of Oncology Practice, 13(3), e259-e265. https://doi.org/10.1200/JOP.2016.01727

▪ **Guo, J., & Lv, W. (2024):** Effect of nursing risk management on perioperative care in cardiovascular interventional catheterization rooms. American Journal of Translational Research, 16(10), 5953. doi: 10.62347/CVBD2727

▪ **Haggag, R., El Dahshan, M.., & Ageiz, M. (2022):** Developing Risk Management Policies for Healthcare Providers at Critical Care Units. Menoufia Nursing Journal, 7(2), 271-283. doi: 10.21608/MENJ.2022.269727

▪ **Huang, C., Wu, H., Lee, Y., & Li, X. (2024):** The Critical Role of Leadership in Patient Safety Culture: A Mediation Analysis of Management Influence on Safety Factors. Risk Management and Healthcare Policy, 513-523.https://doi.org/10.2147/RMHP.S446651.

▪ **Kakemam, E., & Sheikhy-Chaman, M. (2020):** The relationship between patient safety culture and adverse events among nurses in Tehran teaching hospitals in 2019. Avicenna Journal of Nursing and Midwifery Care, 28(4), 20-31.

▪ **Kaya, G. K. (2019):** The relationship between risk management and patient safety incidents in acute hospitals in NHS England. In Industrial Engineering in the Big Data Era: Selected Papers from the Global Joint Conference on Industrial Engineering and Its Application Areas, GJCIE 2018, June 21–22, 2018, Nevsehir, Turkey (pp. 471-479). Springer International Publishing.

▪ **Lee, S., & Dahinten, V. (2021):** Psychological safety as a mediator of the relationship between inclusive leadership and nurse voice behaviors and error reporting. Journal of Nursing Scholarship, 53(6), 737-745. DOI: 10.1111/jnu.12689

▪ **Leithy, S., & Mohamed, H. (2021):** Clinical Risk Management in Healthcare Organization as Perceived by Staff Nurses. Egyptian Journal of Health Care, 12(1), 1281-1298.

▪ **Mistri, I., Badge, A., & Shahu, S. (2023):** Enhancing patient Safety Culture in hospitals. Cureus, 15(12). DOI: 10.7759/cureus.5115

▪ **Mohammadpour, A., Bouraghi, H., Khodaveisi, T., Imani, B., Ghazikhanlousani, K., Azmoonfar, R., & Rafieemehr, H. (2023):** Evaluation of risk management status in selected departments of educational hospitals of Hamadan University of Medical Sciences. International Journal of Risk & Safety in Medicine, (Preprint), 1-15. DOI: 10.3233/JRS-220066

▪ **Naji, G., Isha, A., Mohyaldinn, M., Leka, S., Saleem, M. S., Rahman, S. & Alzoraiki, M. (2021):** Impact of safety culture on safety performance; mediating role of psychosocial hazard: An integrated modelling approach. International journal of environmental research and public health, 18(16), 8568. https://doi.org/10.3390/ijerph18168568

▪ **Niv, Y., & Tal, Y. (2024):** Risk Management and Patient Safety Processes in a Healthcare Organization. In Patient Safety and Risk Management in Medicine: From Theory to Practice (pp. 129-174). Cham: Springer Nature Switzerland. DOI:10.1007/978-3-031-49865-7_11

▪ **Orikpete, O. & Ewim, D. (2024):** Interplay of human factors and safety culture in nuclear safety for enhanced organisational and individual Performance: A comprehensive review. Nuclear Engineering and Design, 416, 112797.

▪ **Ow Yong, L., Xin, X., Wee, J., Poopalalingam, R., Kwek, K., & Thumboo, J. (2020):** Perception survey of crisis and emergency risk communication in an acute hospital in the management of COVID-19 pandemic in Singapore. BMC Public Health, 20, 1-12. https://doi.org/10.1186/s12889-020-10047-2

▪ **Park, S., & Sharp, A. (2019):** Improving health and health care efficiency through risk management. Journal of Hospital Management and Health Policy, 3. doi: 10.21037/jhmhp.2019.04.02

▪ **Saputra, R., Dewi, A., Dewi, D., & Urhmila, M. (2024):** Analysis of 12-Dimensions of Patient Safety Culture at PKU Muhammadiyah Bantul Hospital (Plenary Accredited). Mutiara Medika: Jurnal Kedokteran dan Kesehatan, 24(2), 93-101.

▪ **Shameela, A., & Sulistiadi, W. (2024):** The Role of Teamwork in Building Patient Safety Culture at Hospital "X" in South Jakarta, Indonesia. International Journal of Nursing and Health Services (IJNHS), 7(1). https://doi.org/10.35654/ijnhs.v7i1.765

- **Sorra J, Gray L, Streagle S, Famolaro T, Yount, N, Behm J (2016):** AHRQ Hospital Survey on Patient Safety Culture: User's Guide. Rockville (MD), Agency for Healthcare Research and Quality. [online] [cit. 2017-09-18]. Available from: http://www.ahrq.gov/sites/default/files/wysiwyg/professionals/ quality-patient-safety/patient safety culture/hospital/resources/ hospcult.pdf.

- **Tenza, I., Attafuah, P., Abor, P., Nketiah-Amponsah, E., & Abuosi, A. (2022):** Hospital managers' views on the state of patient safety culture across three regions in Ghana. BMC Health Services Research, 22(1), 1300. https://doi.org/10.1186/s12913-022-08701-z

- **Thangeda, A., & Coleman, A. (2020):** Risk Management framework to improve associated risk of information exchange between users of health information systems in resource-constrained hospitals. In Computational Science and Its Applications–ICCSA 2020: 20th International Conference, Cagliari, Italy, July 1–4, 2020, Proceedings, Part VI 20 (pp. 246-260). Springer International Publishing. https://doi.org/10.1007/978-3-030-58817-5_19

- **Zarezade, M., Abolhasani, M. S., Eslami, S., Salarikhah, E., Bagheri, F., & Salmani, E. (2013):** Evaluation of risk management from the perspective of hospital nurses in Shahid Rahnemon Hospital. Occupational Medicine Quarterly Journal, 5(3), 88-94.