

**EVALUATING THE IMPACT OF RISK MANAGEMENT
PRACTICES ON PATIENT SAFETY CULTURE IN A
TERTIARY HOSPITAL, RIYADH, SAUDI ARABIA**

تقييم أثر ممارسات إدارة المخاطر على ثقافة سلامة المرضى في مستشفى تخصصي،
الرياض، المملكة العربية السعودية

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ABSTRACT

Introduction: Healthcare institutions operate in highly complex environments where patient safety is a fundamental concern. Effective risk management practices are essential for a better patient safety. In recent years, global healthcare organizations have increasingly recognized the importance of building a patient safety culture (PSC)-a shared set of values, beliefs, and norms that prioritize safety at all levels of the organization.

Objectives: The objectives of this research are to assess the level of risk management practice implementation in hospital, to evaluate the prevailing patient safety culture among healthcare workers and to analyze the relationship between risk management practices and patient safety.

Method: The study was based on a quantitative cross-sectional survey. The data collated from employees working in King Abdulaziz Medical City, Riyadh, KSA using stratified sampling method. The study collected data from 377 respondents.

Results:

A significant majority of respondents (94.4%) acknowledged the importance of risk management practices. Poor communication (14.9%) was the most frequently cited risk, followed by physical hazards (6.1%) and knowledge/skills gaps (4.8%). The significance of the ANOVA results ($p=0.000$) and the regression coefficients for risk identification, assessment, mitigation, and monitoring ($p=0.000$, $p=0.021$) confirm that these practices have a measurable effect on safety culture.

Conclusion: The study demonstrates that risk management practices are widely recognized as important in hospital settings, with a majority of respondents affirming their value in enhancing patient safety culture. The analysis of prevalent risks, such as poor communication, physical hazards, and skill gaps, highlights the multidimensional challenges faced by healthcare organizations. The implementation of risk management practices has a statistically significant impact on patient safety culture, as confirmed by regression analysis. The findings underscore the need for a more comprehensive and consistent approach to risk management to strengthen patient safety culture.

Keywords: Risk Management, Patient Safety Culture, Tertiary Hospital, Saudi Arabia.

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List of abbreviations

AHRQ = Agency for Healthcare Research and Quality

ANOVA = Analysis of Variance

HSOPSC = Hospital Survey on Patient Safety Culture

KSA = Kingdom of Saudi Arabia

MoH = Ministry of Health

PSC = Patient Safety Culture

RM = Risk Management

SPSS = Statistical Package for the Social Sciences

1. INTRODUCTION

1.1 Background:

Healthcare institutions operate in highly complex environments where patient safety is a fundamental concern. The delivery of healthcare services is inherently risky due to human factors, technological complexity, and systemic processes. Effective risk management practices are essential in identifying, assessing, and mitigating risks which could lead to adverse events, patient harm, or organizational loss.

In recent years, global healthcare organizations have increasingly recognized the importance of building a patient safety culture (PSC)-a shared set of values, beliefs, and norms that prioritize safety at all levels of the organization. A positive safety culture fosters open communication, non-punitive error reporting, teamwork, and leadership commitment to safety.

Despite the existence of formal risk management systems, incidents of medical errors and safety lapses continue to occur in many healthcare institutions. This raises the question of whether risk management practices are effectively influencing the safety culture among healthcare workers. Understanding this relationship is vital for improving overall healthcare quality and reducing preventable harm.

This study seeks to evaluate the impact of risk management practices on patient safety culture in King Abdulaziz Medical City, Riyadh, Kingdom of Saudi Arabia (KSA).

1.2 Study problem

While many hospitals have adopted structured risk management frameworks, their effectiveness in shaping and strengthening patient safety culture remains uncertain. In some healthcare settings, risk management functions are viewed as administrative compliance rather than integral to daily clinical practice.

The persistence of adverse events, underreporting of errors, and gaps in communication suggest that existing risk management measures may not be adequately embedded in the organizational culture. Therefore, there is a need to empirically assess how the implementation of risk management practices affects the perceptions and behaviors that define patient safety culture among healthcare workers.

1.3 Study purpose

The purpose of the study is to analyze the impact of risk management practices on patient safety culture in a hospital.

1.4 Importance of the study

The importance of this study lies in its potential to bridge the gap between formal risk management practices and the patient safety culture within healthcare institutions. In an era where patient safety is a core component of healthcare quality, understanding how structured risk management systems translate into real-world safety behaviors and attitudes is crucial.

1.4.1 Scientific Importance

1. Contribution to Healthcare Risk Management Literature:

This study expands the existing body of knowledge in the field of healthcare risk management by empirically examining the relationship between structured risk management practices and patient safety culture within healthcare institutions.

2. Bridging a Conceptual Gap:

It addresses a critical gap in academic research by linking formal risk management systems—such as Risk Identification, Risk Assessment, Risk Mitigation and Risk Monitoring and Reporting—with the cultural aspects of patient safety.

3. Enhancing Understanding of Safety Culture Development:

The study provides theoretical insight into how organizational processes and management practices influence the positive patient safety culture among healthcare professionals.

4. Supporting Research in Emerging Healthcare Systems:

It contributes valuable evidence from developing healthcare contexts where systematic safety approaches and integrated risk management frameworks are still evolving.

1.4.2. Practical Importance

1. Improving Patient Safety Practices:

The study offers practical insights into how effective risk management initiatives can directly support the development of a strong patient safety culture, helping healthcare organizations.

2. Guidance for Healthcare Administrators:

The findings can assist hospital administrators and healthcare leaders in evaluating whether existing risk management systems effectively support patient safety goals.

3. Supporting Evidence-Based Decision Making:

The results may help policymakers and healthcare managers design evidence-based policies and management strategies that integrate risk management with safety culture improvement.

4. Enhancing Staff Engagement and Organizational Learning:

By emphasizing transparency, reporting, and teamwork, the study can encourage healthcare institutions to foster environments that promote continuous learning and staff participation in safety initiatives.

1.5 Study Objectives and Questions

The objectives of the study are as follows:

To assess the level of risk management practice implementation in hospital.

To evaluate the prevailing patient safety culture among healthcare workers.

To analyze the relationship between risk management practices and patient safety culture.

The following are the research questions of the study:

- What is the level of risk management practice implementation in the hospital?
- How do healthcare workers perceive the patient safety culture?
- Does risk management practice significantly influence patient safety culture?

1.6 Research hypotheses

The following is the research hypotheses of the study:

H1: There is a significant impact of risk management practices on patient safety culture in a hospital

1.7 Theoretical Model

Various strategies and practices are employed by Saudi Arabian health institutions to establish a robust risk management framework. These include:

Risk Identification: Health institutions conduct regular risk assessments to identify potential risks and vulnerabilities. This process involves gathering and analyzing data

from various sources such as patient records, safety incidents, and feedback from staff and patients.

Risk Assessment: Once identified, each risk is assessed to determine the likelihood and potential impact it might have on the institution. This assessment helps to prioritize the risk management efforts and identify areas that require immediate attention.

Risk Mitigation: Based on the risk assessment, appropriate measures are implemented to mitigate the risks associated with each identified risk. These measures may include implementing safety protocols, enhancing training programs, implementing automated systems, or purchasing appropriate insurance coverage.

Risk Monitoring and Reporting: Health institutions continuously monitor the identified risks and make necessary adjustments as needed. Regular reports are submitted to the relevant stakeholders, including senior management, regulatory bodies, and patients, to provide updates on the status of risk management efforts.

Risk management practices play a crucial role in strengthening **patient safety culture** within healthcare organizations. Patient safety is defined as “the avoidance and prevention of patient injuries or adverse events resulting from the processes of healthcare delivery”. Patient safety culture refers to the shared values, beliefs, attitudes, and behaviors that prioritize patient safety in clinical and administrative processes. However, an effective risk management helps healthcare institutions identify potential hazards, reduce medical errors, and promote a proactive approach to safety.

2. LITERATURE REVIEW

2.1 Introduction

Previous studies have established that effective risk management contributes to better patient outcomes by identifying potential hazards and implementing preventive measures (Flin et al., 2017; Singer et al., 2020). The Hospital Survey on Patient Safety Culture (HSOPSC) has been widely used to measure the perceptions of safety culture across various dimensions, including teamwork, communication openness, management support, and non-punitive response to errors (AHRQ, 2018).

Research also indicates that a strong patient safety culture is positively correlated with leadership involvement in risk management and the presence of structured safety systems (El-Jardali et al., 2019). However, the degree to which these practices translate into daily operations varies significantly across institutions and contexts, highlighting the need for localized assessments.

A safety culture plays a crucial role in determining an organization's vulnerability to errors and its ability to effectively manage risks in healthcare settings. Using a top-down approach, the study emphasizes that leadership and management attitudes about safety significantly influence the development of a mature safety culture. The flow of information, especially how organizations respond to anomalies and unexpected events, is a key indicator of organizational safety culture maturity. (St Pierre, M., 2013).

Simsekler's work focuses on an essential aspect of safety in hospitals which is identifying risk. The study evaluates risk identification practices and its association with a safety culture. The authors draw on real-world practices in the UK, using interview-based questionnaires completed by eight participants (including managers, nurses and a medical

consultant). The approach to risk identification can be retrospective and relies on existing tools and methodologies. The findings suggest that current risk identification methods are typically postmortem and rely on tools or methodologies which exist. Effective risk identification is closely related to an organization's prevailing safety culture. (Simsekler, M. C. E., 2019).

2.2 Dependent Variable

The dependent variable of the study is "Patient Safety Culture"

2.3 Independent Variable

The Independent variables are: Risk Identification, Risk Assessment, Risk Mitigation, Risk Monitoring and Reporting

2.4 Summary of Past studies

Several essential determinants are associated with the safety culture of patients, including teamwork and organizational and behavioral learning, error reporting, awareness of safety, gender and demographic characteristics, experience at work as well - staffing level. These factors should be considered when designing strategies to improve patient safety culture in hospitals. (Azyabi, A., et al. 2021)

The work by Nieva, V. F., and Sorra, J., examines a variety of safety culture assessment tools currently available and their key characteristics and applications in healthcare. It gives examples of healthcare organizations that have used these assessment tools to better understand their internal safety culture and identify areas for improvement. Using real-world examples, the study illustrates how safety culture assessments can benefit patient

safety initiatives and organizational learning. This paper argues that safety culture assessments can improve patient safety (Nieva, V. F., & Sorra, J. 2003).

In order to promote patient safety, risk management activities are considered long-term endeavors; they achieve success by changing the organization's safety culture, rather than changing work processes frequently in response to specific shortcomings identified in adverse events. For risk management activities to effectively achieve their goals of improving patient safety, they must be conducted in a professional, well-planned, systematic, and continuous manner, incorporating a balanced combination of the three approaches (Niv, Y., & Tal, Y., 2024).

2.5 Theoretical Framework of the Study

The theoretical foundation of this study is grounded in the systems theory and safety culture framework proposed by the Agency for Healthcare Research and Quality (AHRQ). Systems theory emphasizes that healthcare safety outcomes result from the interaction of people, processes, and organizational structures rather than isolated individual actions. In this context, effective risk management practices function as integral system components that identify, assess, and control risks to enhance overall safety performance.

2.5.1 Definition of Risk

The concept of risk can be understood as the possibility that a decision or action may lead to an undesirable outcome or loss.

- "Effect of uncertainty on objectives": ISO 31000-2018.

- "The potential for unwanted or negative consequences of an event or activity":
(Rowe, 1977)

In management practice, risk refers to the uncertainty associated with future events that may affect the achievement of organizational objectives.

In healthcare settings, risk specifically relates to events or conditions that may harm patients, healthcare workers, or the organization.

2.5.2 Types of Risks in Healthcare

Healthcare organizations face several types of risks that may affect patient safety and operational efficiency. Important categories include:

- **Knowledge and Skills Gaps**

Occur when healthcare professionals lack adequate training, expertise, or updated knowledge required to perform clinical tasks safely.

- **Human Error**

Mistakes in clinical judgment, medication administration, or procedural activities that may lead to patient harm.

- **Poor Communication**

Ineffective information transfer between healthcare providers, departments, or shifts, which can lead to misunderstandings and clinical errors.

- **Inadequate Staffing**

Shortage of qualified healthcare professionals, resulting in increased workload, fatigue, and a higher probability of mistakes.

- **Physical Hazards**

Unsafe environmental conditions such as slippery floors, poor lighting, or infection hazards that may harm patients or staff.

- **Equipment Malfunction**

Failure or improper functioning of medical equipment, which can disrupt patient care or lead to inaccurate diagnosis or treatment.

- **Inadequate Infrastructure**

Poorly designed facilities, insufficient medical supplies, or lack of modern technology that can compromise quality and safety of care.

2.5. 3. Classification of Risks (Example: Hospitals in Riyadh)

Hospitals in Riyadh and other advanced healthcare systems commonly classify risks into several organizational categories:

1. **Clinical Risks** – Risks related to patient diagnosis, treatment, medication, and clinical procedures.
2. **Operational Risks** – Risks arising from internal processes, staffing, and hospital operations.
3. **Financial Risks** – Risks related to budgeting, billing errors, and financial management.
4. **Strategic Risks** – Risks associated with long-term planning, policy decisions, and organizational reputation.
5. **Compliance and Legal Risks** – Risks related to regulatory requirements, legal obligations, and accreditation standards.

6. **Environmental and Safety Risks** – Risks arising from workplace safety, infection control, or disaster preparedness.

2.5.4. Sources of Risk

Risks in healthcare organizations may originate from multiple sources, including:

- **Human factors** (staff fatigue, lack of training, negligence)
- **Technological factors** (equipment failure, IT system breakdown)
- **Organizational processes** (inefficient procedures or poor coordination)
- **Environmental conditions** (hospital infrastructure, infection risks)
- **External factors** (regulatory changes, pandemics, disasters)

Understanding these sources helps healthcare administrators design effective preventive strategies.

2.5. 5 Steps of Risk Management

Risk management is a systematic process used by healthcare organizations to minimize potential harm and improve patient safety.

1. Risk Identification

This is the **first step**, where potential risks are recognized and documented.

Methods include:

- Incident reporting systems
- Safety audits and inspections
- Staff feedback and patient complaints
- Clinical reviews

2. Risk Assessment

After identifying risks, the organization evaluates:

- **Likelihood** of the risk occurring
- **Severity** of potential harm
- **Impact on patients and hospital operations**

This helps prioritize which risks require immediate attention.

3. Risk Mitigation

This step focuses on **developing strategies to reduce or eliminate risks**.

Examples include:

- Staff training programs
- Implementation of clinical protocols
- Maintenance of medical equipment
- Improved communication systems

4. Risk Monitoring and Reporting

Continuous monitoring ensures that risk control measures are effective.

Activities include:

- Regular safety audits
- Monitoring incident reports
- Reporting outcomes to hospital management
- Updating risk management policies

The theoretical model of the study is that “risk management practices will impact on the patient safety culture in the hospital” (Fig 2.1).

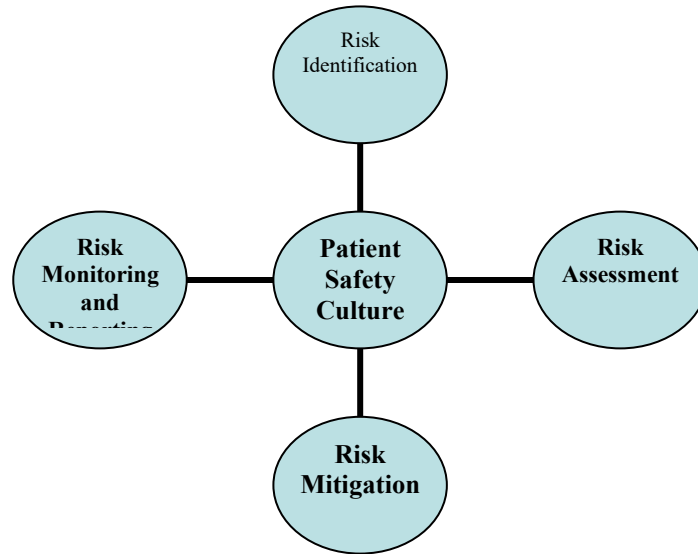


Figure 2.1: Theoretical model of the study

3. RESEARCH METHODOLOGY

3.1 Introduction

Research methodology refers to the systematic framework used to collect, analyze, and interpret data in order to address research objectives and answer research questions (Creswell, 2014). This study adopted a quantitative research approach to examine the selected research variables among healthcare professionals working at King Abdulaziz Medical City, Riyadh, Kingdom of Saudi Arabia (KSA).

3.2 Research Design

The study was based on a quantitative cross-sectional survey. This design was useful to collect the data from a large number of participants at a single point in time to identify patterns, perceptions, and relationships between variables.

3.3 Population of the study

The population of the study consisted of healthcare employees working King Abdulaziz Medical City, Riyadh, KSA. The population of the study includes doctors, nurses, and administrative staff. Based on available institutional information, the estimated population size for the study was 6,500 employees.

3.4 Sampling Technique

Stratified random sampling was used to ensure representation from various professional groups. The population was divided into three strata: doctors, nurses, and

administrative/technical staff. Proportionate allocation was applied to distribute the sample across these strata according to their population size.

Stratified sampling is a probability sampling method in which the population is divided into homogeneous subgroups or strata based on specific characteristics, and samples are then drawn from each stratum proportionally (Creswell, 2014; Kumar, 2019). The use of stratified sampling in this study improves the representativeness of the sample and reduces sampling bias. It also allows for meaningful comparisons among different professional groups within the hospital workforce, thereby enhancing the reliability and validity of the research findings (Sekaran & Bougie, 2016).

3.5 Sample Size Determination

The sample size for this study was determined using Yamane's (1967) formula for calculating sample size from a finite population. The total population of the study consisted of approximately 6,500 employees working at King Abdulaziz Medical City, Riyadh, including doctors, nurses, and administrative/technical staff.

To calculate the sample size for a Stratified Sampling Technique, we first estimate the total population (N) and then determine the sample size (n) using a common formula such as Yamane's Formula (widely used in social science research).

Table 3.1 : Estimated Total Population (N)

Staff Category	Approximate Number
Doctors	1,500

Staff Category	Approximate Number
Nurses	4,000
Administrative staff	1,000
Total Population (N)	6,500

Source: Hospital data

Calculate Overall Sample Size

Using a 95% confidence level and a margin of error of 5%, the required sample size was calculated using the **Yamane's Formula (1967)**:

$$n = \frac{N}{1 + N(e^2)}$$

Where

- **n** = Sample size
- **N** = Population size
- **e** = Margin of error (usually **0.05 for 95% confidence level**)

Where n represents the sample size, N is the total population, and e is the level of precision (0.05). Substituting the population value ($N = 6,500$) into the formula yielded a required sample size of 377 respondents.

$$n = \frac{6500}{1 + 6500(0.05^2)}$$

$$n = \frac{6500}{1 + 6500(0.0025)}$$

$$n = \frac{6500}{17.25}$$

$$n \approx 377$$

Total Sample Size ≈ 377 respondents

Stratified Sample Allocation

A stratified sampling technique was employed to ensure adequate representation of each professional category within the hospital workforce. The population was divided into three strata: doctors, nurses, and administrative staff. Proportionate allocation was then used to determine the number of respondents selected from each stratum. Based on this proportional distribution, the sample consisted of 87 doctors, 232 nurses, and 58 administrative staff members. This approach ensured that the sample accurately reflected the structure of the study population and enhanced the representativeness and reliability of the findings.

Then distributed the 377 sample proportionally among the three strata.

Formula:

$$n_h = \frac{N_h}{N} \times n$$

Where

- **n_h** = sample from each stratum
- **N_h** = population of each stratum

Doctors

$$n_h = \frac{1500}{6500} \times 377$$

$$= 0.23 \times 377 \approx 87$$

Doctors Sample = 87

Nurses

$$n_h = \frac{4000}{6500} \times 377$$

$$= 0.615 \times 377 \approx 232$$

Nurses Sample = 232

Administrative Staff

$$n_h = \frac{1000}{6500} \times 377$$

$$= 0.154 \times 377 \approx 58$$

Administrative Staff Sample = 58

Table 3.2 Stratified Sample Size

Staff Category	Population	Sample Size
Doctors	1,500	87
Nurses	4,000	232
Administrative staff	1,000	58
Total	6,500	377

Final Sample Size for Study = 377 respondents

3.6 Data Collection Tool

The study used a structured questionnaire to collect the data from the respondents. The study adopted the modified Hospital Survey on Patient Safety Culture (HSOPSC 2.0) questionnaire developed by Agency for Healthcare Research and Quality (AHRQ). It contains five sections: First is about demographic data, which contains the questions about the respondent's details. The second part is about the type of risks in the hospital settings. The third section focus on **level of** risk management practices; fourth section deals with prevailing patient safety culture among healthcare workers and the fifth section includes the impact of risk management practices on patient safety culture.

3.7 Data Collection Procedure

Permission was sought from the hospital administration and ethics committee. Questionnaires was distributed physically and electronically to participants. Respondents were assured of confidentiality and anonymity.

3.8 Method of Analysis

An analysis was conducted using SPSS, IBM Version 25 (Statistical Package for the Social Sciences). Data was entered in excel and uploaded in SPSS, then analyzed by a personal computer. The descriptive statistics such as frequencies, and percentages were used. Liner Regression test was performed to examine the impact of risk management practices on patient safety culture and to test the proposed hypothesis of the study. An appropriate tables and figures used to present the data analysis and proper care was taken while interpreting the data.

3.9 Limitations

While this study aims to provide meaningful insights into the relationship between risk management practices and patient safety culture, certain limitations must be acknowledged.

Firstly, the study was conducted in a single public hospital located in Riyadh, which limited the generalizability of the findings to other healthcare institutions within the country. Secondly, the study focused primarily on evaluating the perceptions of healthcare workers regarding risk management and patient safety culture. It did not analyze the direct impact of institutional risk management practices on measurable health outcomes such as patient morbidity, mortality, or readmission rates.

Additionally, the study relied on self-reported data collected through questionnaires, which may be subject to response bias or social desirability bias. Despite these limitations, the research can provide valuable insights into how risk management practices impact patient safety culture perceptions and contribute to the broader understanding of risk management and patient safety in healthcare settings.

4. PRACTICAL STUDY

4.1 Data Analysis

This chapter provides the results of the study. The demographic information and the perceptions about the importance of risk management practices in hospitals are presented. The chapter also provides analysis on the type of the risk prevalent and level of risk management practices in the hospital. The perceived patient safety culture and the impact of risk management practices on patient safety culture are presented in this chapter.

4.2 Research Findings

The findings of the study are provided below:

4.2.1 Demographic detail

Out of total 377 responses, the majority were nursing staff (61.5%), followed by doctors (23.1%) and remaining are administrators (15.4). Most of the respondents (41.9%) have work experience of one to five years, followed by 20.7% of them with six to ten years of experience, whereas 11.9% of the respondents with less than one year and 10.6% have more than twenty-one years of work experience in the hospital. 14.9% of the respondents have eleven to twenty years of work experience in the hospital. When it comes to work experience in current unit/work area, more than fifty percent of the respondents (51.8%) have work experience of one to five years, followed by 18% of them with less than one year of experience, whereas 13.8% of the respondents with six to ten years and 12.2% have eleven to twenty years of work experience. 4.2% of the respondents have the work experience of more than 21 years in their current unit/work area.

Out of the total respondents, the majority were males (55.2) and remaining (44.8%) were females. Most of the respondents were between the age group of 25-35 years (51.7%), followed 20.7% of the respondents between 18-25 years and 15.9% were between 35-45 years. Among the remaining respondents, 8.5% were between 45-55 years and 3.2 % were 55 and above years. The education level of more than sixty percent of the participants was Bachelor Level (67.9%), participants having a Masters were 17.3%, diploma 11.1% and only 3.7 were above masters (Table 4.1)

Table 4.1: Demographic details of the respondents

Variable	Classification	Frequency	%
Staff Position	Doctor	87	23.1
	Nurse	232	61.5
	Administration	58	15.4
Work Experience in Hospital	Less than 1 year	45	11.9
	1-5 years	158	41.9
	6-10 years	78	20.7
	11-20 years	56	14.9
	21 and more years	40	10.6
Work Experience in current unit/work area	Less than 1 year	68	18.0
	1-5 years	195	51.8
	6-10 years	52	13.8
	11-20 years	46	12.2
	21 and more years	16	4.2
Gender	Male	208	55.2
	Female	169	44.8
Age	18-25 years	78	20.7
	25-35 years	195	51.7
	35-45 years	60	15.9
	45-55 years	32	8.5
	55 and above	12	3.2
Education	Diploma	42	11.1
	Bachelors	256	67.9
	Masters	65	17.3
	Above Masters	14	3.7

4.2.2 Risk management practices are important in hospital

Out of the total respondents, majority 356 (94.4%) reported that the risk management practices are important in hospital, while 7 (1.9%) respondents report not important and 14 (3.7%) respondents reported that they don't know. (Figure 4.1)

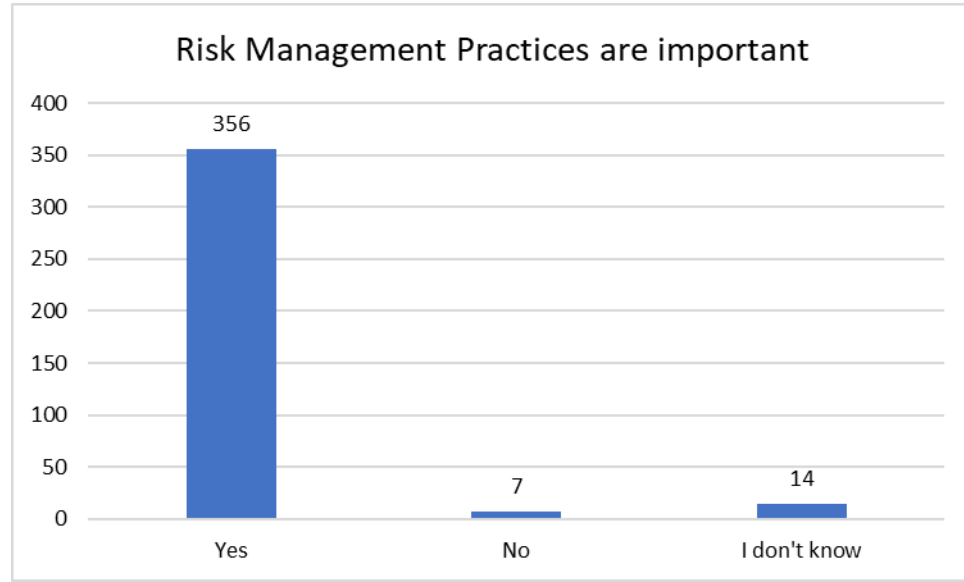


Fig 4.1: Risk management practices are important

4.2.3 Types of risks prevalent in hospital

Table 4.2 presents the various types of risks prevalent in the hospital and respondents' familiarity with them. Out of the total respondents, 56 (14.9%) reported about the poor communication, followed by 23 (6.1%) about the physical hazards and 18 (4.8%) about the knowledge and skills gap. Remaining respondents reported about equipment malfunction (4.2%), inadequate infrastructure (3.2%) and inadequate staffing (2.1%). (Table 4.2).

Table 4.2: Types of risk prevalent in the hospital

Types of risk	Yes		No		I don't know	
	Frequency	%	Frequency	%	Frequency	%

Knowledge and Skills Gaps	18	4.8	327	86.7	32	8.5
Human Error	6	1.6	288	76.4	83	22.0
Poor Communication	56	14.9	295	78.2	26	6.9
Inadequate Staffing	8	2.1	355	94.2	14	3.7
Physical Hazards	23	6.1	305	80.9	49	13
Equipment Malfunction	16	4.2	292	77.5	69	18.3
Inadequate Infrastructure	12	3.2	318	84.4	47	12.5

4.2.4 Risk management practice in the hospital

The study assessed the level of risk management practice implementation in the hospital based on parameters i.e. 1. Risk identification 2. Risk assessment 3. Risk mitigation 4. Risk monitoring and reporting (Table 4.3). In terms of risk management practice, 216 (57.3%) of respondents were reported strongly agree, 104 (27.6%) were with agree it. Risk assessment was strongly agreed by 54.6% of the respondents, 30.2 % agreed with it. Whereas 41.4% were agreed and 21.5% were strongly agreed for the risk mitigation. There are, however, 36.9% of the respondents agreed and 15.6% were strongly agreed, but 34% of the respondents neither agreed and nor disagreed about the risk monitoring and reporting (Table 4.3).

Table 4.3: Risk management practice in the hospital

Risk Management	SD		D		NAD		A		SA	
	#	%	#	%	#	%	#	%	#	%
Risk Identification	6	1.6	8	2.1	43	11.4	104	27.6	216	57.3
Risk Assessment	10	2.7	12	3.2	35	9.3	114	30.2	206	54.6
Risk Mitigation	16	4.2	20	5.3	104	27.6	156	41.4	81	21.5
Risk Monitoring and Reporting	17	4.5	34	9.0	128	34.0	139	36.9	59	15.6

*SD=Strongly Disagree, D=Disagree, NAD=Neither Agree nor Disagree, A=Agree, SA=Strongly Agree

4.2.5 Perceived Patient safety culture among healthcare workers

The study assessed perceived the patient safety culture among healthcare workers. In terms of patient safety culture in their unit/work areas, 64.7% of respondents were strongly agreed, 14.9% strongly agreed and 17.2% neither agreed nor disagreed. Regarding patient safety culture of the respondent's immediate Supervisor, Manager, or Clinical Leader, 38.5% of the responded strongly agreed, 49.3% agreed and 1.6% and 2.4% strongly disagreed and disagreed respectively. 43% respondents agreed about the patient safety culture and communication in their unit/work areas, 34.7% strongly agreed. It can be observed that 6.4% and 1.9% of the respondents were disagreed and strongly disagreed. However, 40.3% and 35.8% of the respondents strongly agreed and agreed respectively about the reporting patient safety events. 28.4% of respondents who are unaware of cybersecurity, 27.5 percent whereas 20.7 % of the respondents neither agreed and disagreed for the same patient safety culture (Table 4.4).

Table 4.4: Perceived Patient safety culture

	SD		D		NAD		A		SA	
Patient safety culture	#	%	#	%	#	%	#	%	#	%
Patient safety culture in your Unit/Work Areas	4	1.1	8	2.1	65	17.2	56	14.9	244	64.7
Patient safety culture of your immediate Supervisor, Manager, or Clinical Leader	6	1.6	9	2.4	31	8.2	186	49.3	145	38.5
Patient safety culture and communication in your Unit/Work	7	1.9	24	6.4	53	14.1	162	43.0	131	34.7

Areas										
Patient safety culture about reporting patient safety events	5	1.3	7	1.9	78	20.7	135	35.8	152	40.3

*SD=Strongly Disagree, D=Disagree, NAD=Neither Agree nor Disagree, A=Agree, SA=Strongly Agree

4.2.6 Impact of risk Management Practices on Patient Safety Culture

The study conducted a regression analysis to examine the impact of risk management practice on patient safety culture in the hospital. Table 4.5 shows the model summary.

The ANOVA result shown in table 4.6 indicates that there is a significance with 0.000.

Table4.5: Model Summary^b

Model	R	R Square	Adjusted Square	R Std. Error of the Estimate	Durbin-Watson
1	.955 ^a	.913	.912	.308	.281

a. Predictors: (Constant), Risk Identification, Risk Assessment, Risk Mitigation, Risk Monitoring and Reporting

b. Dependent Variable: Patient safety culture

Table 4.6: ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	369.908	4	92.477	972.734	.000 ^b
Residual	35.366	372	.095		
Total	405.273	376			

a. Dependent Variable: Patient Safety Culture

b. Predictors: (Constant), Risk Identification, Risk Assessment, Risk Mitigation, Risk Monitoring and Reporting

The Regression test results (Table 6) show that risk management practices i.e. Risk Identification, Risk Assessment, Risk Mitigation, Risk Monitoring and Reporting have an impact on patient safety culture ($p=0.000$, $p=0.021$, which are less than 0.05).

Table6: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.205	.100		2.043	.042
1 RI - PSC	.797	.080	.783	10.015	.000
RA-PSC	.247	.066	.210	3.739	.000
RM - PSC	.694	.054	.555	12.839	.000
RMR-PSC	.184	.079	.165	2.316	.021

a. Dependent Variable: Patient Safety Culture

4.2.7 Discussion

The data analysis on risk management practices and their impact on patient safety culture provides valuable insights into the perceived importance and implementation of these practices in hospital settings. A significant majority of respondents (94.4%) acknowledged the importance of risk management practices, which aligns with findings from similar studies emphasizing the critical role of risk management in improving healthcare quality and safety. For instance, research has shown that effective risk management can reduce adverse events, enhance patient outcomes, and foster a culture of safety within healthcare organizations. However, the small proportion of respondents who found these practices unimportant (1.9%) or were unsure (3.7%) suggests potential gaps in awareness, training, or the

perceived relevance of these practices among certain groups, which warrants further investigation. The types of risks prevalent in hospitals, as reported by respondents, offer a detailed view of operational challenges. Poor communication (14.9%) was the most frequently cited risk, followed by physical hazards (6.1%) and knowledge/skills gaps (4.8%). These findings are consistent with previous studies that identify communication failures as a leading cause of medical errors and patient harm. For example, the Joint Commission has highlighted poor communication as a root cause in over 70% of sentinel events. Physical hazards and skill-related deficiencies also resonate with literature on workplace safety, where inadequate training and environmental risks are frequently associated with increased error rates. Equipment malfunction (4.2%), inadequate infrastructure (3.2%), and staffing issues (2.1%) further underscore the multifactorial nature of risks in hospital environments, suggesting the need for comprehensive risk management strategies that address both human and system-level factors. The assessment of risk management practice implementation based on parameters such as risk identification, assessment, mitigation, and monitoring provides a structured view of how these practices are perceived by healthcare workers. The high levels of agreement on risk identification (57.3% strongly agree) and assessment (54.6% strongly agree) indicate that these components are well-recognized and potentially well-executed in the studied hospital. However, the relatively lower levels of strong agreement on risk mitigation (41.4% agreed, 21.5% strongly agreed) and mixed responses on risk monitoring and reporting (36.9% agreed, 15.6% strongly agreed, 34% neutral) suggest areas for improvement. These results are consistent with studies that find risk mitigation and monitoring to be more challenging due to resource constraints, lack of standardized processes, or insufficient follow-up mechanisms. For instance,

a study on hospital risk management in low and middle income countries found that while identification and assessment were often prioritized, mitigation and reporting were frequently deprioritized due to limited resources and staff engagement. The perceived patient safety culture among healthcare workers further contextualizes the impact of risk management practices. The high levels of strong agreement (64.7%) and agreement (14.9%) on patient safety culture in work areas suggest a positive correlation between risk management practices and safety culture. This finding is supported by prior research indicating that robust risk management frameworks contribute to a stronger safety culture by promoting accountability, transparency, and proactive problem solving. Similarly, the positive perceptions of patient safety culture related to supervisors, managers, and clinical leaders (38.5% strongly agreed, 49.3% agreed) highlight the role of leadership in reinforcing safety practices. However, the presence of disagreement (6.4% disagreed, 1.9% strongly disagreed) and neutral responses (17.2% neither agreed nor disagreed) on certain aspects of safety culture indicates variability in experiences, which could be linked to inconsistencies in risk management implementation or communication gaps. The regression analysis results provide empirical support for the hypothesized impact of risk management practices on patient safety culture. The significance of the ANOVA results ($p=0.000$) and the regression coefficients for risk identification, assessment, mitigation, and monitoring ($p=0.000$, $p=0.021$) confirm that these practices have a measurable effect on safety culture. This finding is in line with studies that have used similar analytical approaches to demonstrate the positive influence of risk management on safety outcomes. For example, a systematic review of risk management practices in hospitals found that structured risk assessment and mitigation processes were associated with improved safety culture scores and reduced error rates

. When compared to similar studies, the findings suggest that while hospitals may recognize the importance of risk management, the effectiveness of these practices can vary based on factors such as resource availability, staff training, and leadership support. For instance, a study on patient safety culture in European hospitals found that while safety culture was generally perceived positively, gaps in risk monitoring and reporting were common, particularly in resource-limited settings. This comparison underscores the need for targeted interventions to strengthen weaker components of risk management, such as monitoring and reporting, to ensure a comprehensive approach to patient safety. In conclusion, the data analysis highlights the critical role of risk management practices in shaping patient safety culture. While the high levels of agreement on the importance and implementation of these practices are encouraging, the identified gaps in risk mitigation, monitoring, and reporting point to areas for improvement. Drawing on lessons from similar studies, hospitals can enhance their risk management frameworks by investing in staff training, improving communication channels, and leveraging digital tools such as predictive analytics to support real-time risk monitoring.

The findings may serve as a reference for future researchers to further investigate the interaction between risk management strategies, organizational culture, and healthcare quality outcomes.

5. CONCLUSION

The study demonstrates that risk management practices are widely recognized as important in hospital settings, with a majority of respondents affirming their value in enhancing patient safety culture. The analysis of prevalent risks, such as poor communication, physical hazards, and skill gaps, highlights the multidimensional challenges faced by healthcare organizations. The implementation of risk management practices—encompassing risk identification, assessment, mitigation, and monitoring—has a statistically significant impact on patient safety culture, as confirmed by regression analysis. However, the mixed responses on risk monitoring and reporting, as well as the presence of neutral or negative perceptions of safety culture in some areas, indicate room for improvement. These findings underscore the need for a more comprehensive and consistent approach to risk management to strengthen patient safety culture.

5.1 Recommendations

1. **Enhance Risk Monitoring and Reporting:** Hospitals should prioritize the development of standardized processes for risk monitoring and reporting to ensure these components are as robust as risk identification and assessment. This can include implementing digital tools, such as AI-driven analytics, to facilitate real-time tracking and reporting of risks.
2. **Invest in Staff Training and Awareness:** Continuous education and training programs should be introduced to address knowledge and skill gaps among healthcare workers. These programs should focus on improving communication, understanding risk management practices, and fostering a culture of safety.

3. Address Systemic Vulnerabilities: Hospitals should conduct targeted interventions to mitigate prevalent risks, such as poor communication and physical hazards. This could involve redesigning workflows, improving infrastructure, and ensuring adequate staffing levels.
4. Leverage Digital Technologies: The integration of digital tools, such as predictive analytics and blockchain, can enhance the efficiency and transparency of risk management practices. These technologies can support proactive risk identification and mitigation, contributing to a safer healthcare environment.
5. Strengthen Leadership Support and policy: Hospital leadership and clinical managers must actively promote and model risk management practices to reinforce their importance. This includes providing resources, setting clear expectations, and encouraging open communication about safety concerns. Insights from this study can inform policy development, emphasizing the importance of risk management as a pillar of healthcare system resilience. Policymakers should consider mandating risk management frameworks and providing support for their implementation.

By addressing these recommendations, hospitals can build a stronger foundation for risk management, ultimately improving patient safety culture and contributing to the broader goal of resilient hospital.

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Appendix : Questionnaire

Instructions: I am working on impact of risk management practices on patient safety culture. The objective of this study is to understand the risk management practices on patient safety culture in a tertiary hospital, Riyadh, Saudi Arabia.

After reading the study objective, please proceed with this questionnaire only if you are willing to participate. Those who are completing the study are presumed to be consenting.

Since the results are aggregated and overall, the confidentiality of the information will be maintained at all levels. So, I am humbly seeking your participation in the survey.

Section No. I: Demographic data

1. Your Staff Position
 - ☐ Doctor
 - ☐ Nurse
 - ☐ Administrator
2. How long have you worked in this hospital?
 - ☐ Less than 1 year
 - ☐ 1-5 years
 - ☐ 6-10 years
 - ☐ 11-20 years
 - ☐ 21 or more years
3. In this hospital, how long have you worked in your current unit/work area?
 - ☐ Less than 1 year
 - ☐ 1-5 years
 - ☐ 6-10 years
 - ☐ 11-20 years
 - ☐ 21 or more years
4. Gender:
 - ☐ Male
 - ☐ Female
5. Age in years:
 - ☐ 18-25 years
 - ☐ 25-35 years
 - ☐ 35-45 years
 - ☐ 45-55 years
 - ☐ Above 55 years
6. Education level:
 - ☐ Diploma
 - ☐ Bachelors
 - ☐ Masters
 - ☐ Above Masters
7. In your opinion, is Risk Management Practices are important in Hospitals?
 - ☐ Yes
 - ☐ No
 - ☐ I don't know

Section No.II: Which of the following risk are prevalent in your hospital?

	Yes	No	I don't know
Knowledge and Skills Gaps			
Human Error			
Poor Communication			
Inadequate Staffing			
Physical Hazards			
Equipment Malfunction			
Inadequate Infrastructure			

Section No.III: How much do you agree about the level of risk management practices in your hospital?

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. Risk Identification					
2. Risk Assessment					
3. Risk Mitigation					
4. Risk Monitoring and Reporting					

Section IV:

How much do you agree or disagree with the following statements on prevailing patient safety culture among healthcare workers

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
1. Patient safety culture in your Unit/Work Areas					

2. Patient safety culture of your immediate Supervisor, Manager, or Clinical Leader					
3. Patient safety culture and communication in your Unit/Work Areas					
4. Patient safety culture about reporting patient safety events					

Section No.V: Risk Management Practices have an impact on Patient Safety Culture

Impact	Strongly Disagree	Disagree	Neither Agree nor disagree	Agree	Strongly Agree
Risk Identification has an impact on patient safety culture					
Risk Assessment has an impact on patient safety culture					
Risk Mitigation has an impact on patient safety culture					
Risk Monitoring and Reporting has an impact on patient safety culture					

Overall, is Risk Management Practices having an impact on Patient Safety Culture?

- ☐ Strongly Disagree
- ☐ Disagree
- ☐ Neither agree nor disagree
- ☐ Agree
- ☐ Strongly Agree

Please feel free to provide any comments about how things are done or could be done in your hospital that might affect patient safety.

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Thank you for completing this survey.