

AMERICAN UNIVERSITY OF BEIRUT

PATIENT SAFETY KNOWLEDGE AND COMPLIANCE
AMONG PHYSICIANS IN PUBLIC HOSPITALS IN LEBANON

by
MOHAMED MOUSTAFA KHAMIS

A thesis
submitted in partial fulfillment of the requirements
for the degree of Master of Science
to the Department of Epidemiology and Population Health
of the Faculty of Health Sciences
at the American University of Beirut

Beirut, Lebanon
April 2024

AMERICAN UNIVERSITY OF BEIRUT

PATIENT SAFETY KNOWLEDGE AND COMPLIANCE
AMONG PHYSICIANS IN PUBLIC HOSPITALS IN LEBANON

by
MOHAMED MOUSTAFA KHAMIS

Approved by:

Dr. Salim M. Adib, Professor
Department of Epidemiology and Population Health

Advisor

Dr. Monique Chaaya, Professor
Department of Epidemiology and Population Health

Member of Committee

Dr. Fadi El Jardali, Professor
Department of Epidemiology and Population Health

Member of Committee

Date of thesis defense: April 24, 2024

ABSTRACT

OF THE THESIS OF

Mohamed Moustafa khamis

for

Master of Science

Major: Epidemiology

Title: Patient Safety Knowledge and Compliance Among Physicians in Public Hospitals in Lebanon

Introduction: Patient safety (PS) remains a paramount concern within the global healthcare landscape. Among healthcare practitioners, physicians, by virtue of their central role in healthcare, have a major direct and indirect influence on PS. Their knowledge and practices shape the safety culture and the prevention of adverse events. This research aims at evaluating PS knowledge, attitudes, and practices, and their determinants among physicians in all 28 Lebanese public hospitals.

Methods: Data were obtained for analysis from a previous exhaustive survey in 2020-2021.

Results: The survey included 111 physicians, of whom 67% were men and 33% women. The average age of the group was 34 years. Most work locations (62.2%) were in rural areas. About 65% reported the absence of PS training in their medical curriculum. Six dimensions of PS knowledge were summed up in one overall score, with a mean of 60 on a scale of 0-100 (SD= 19.9). The mean actual “compliance” of participants with PS goals, was 58.8 (SD = 10.7) on a range from 0-100. On multivariate linear regression, higher compliance with PS goals was associated with the hospital’s urban location, alternating work schedule, presence of a PS office, PS knowledge score, and lower frequency of reporting events.

Discussion and conclusions: Compliance was highest in urban hospitals, often linked to a university, although some notable exceptions imply that urban location and university affiliation alone do not guarantee robust PS practices. Physicians’ engagement, institutionalized prioritization of patient safeguards, and enforced protocols on the other hand appear to be vital determinants of successful implementation. Active monitoring and oversight mechanisms specifically targeting physicians may yield an important improvement, especially since physicians are often looked upon as leaders in establishing and upholding PS standards within a hospital setting. The implementation of PS structures and protocols can be enhanced through a reformed accreditation process integrating more dimensions of PS than is the current practice. Inter-hospital collaboration within the same geographical area to create CME modules for training in PS has been reported to be a good tool for improvement in PS outcomes in Lebanon.

TABLE OF CONTENTS

ABSTRACT	1
TABLES.....	4
ABBREVIATIONS.....	5
INTRODUCTION.....	6
1.1. Presentation of the Issue	6
1.2. Aims and Objectives.....	7
1.3. Research Questions.....	7
LITERATURE REVIEW.....	9
2.1. Hospital Survey on Patient Safety Culture (HSOPSC)	21
METHODS.....	23
3.1. Study Design.....	23
3.2. Target Population.....	23
3.3. Sampling Procedures and Inclusion Criteria.	23
3.4. Survey Tool.....	24
3.5. Definition of Variables	25
3.5.1. Dependent Variables.....	25
3.5.2. Independent Variables	26
3.5.3. Other Related PS Outcomes and Indicators.....	32
3.6. Ethical Considerations	33
3.7. Statistical Analysis.....	33
RESULTS.....	35

DISCUSSION	40
CONCLUSIONS AND RECOMMENDATIONS	47
6.1. The Ministry of Public Health (MOPH)	47
6.2. The Syndicate of Private Hospitals (SPH).....	48
6.3. Hospital Managers	48
6.7. Lebanese Orders of Physicians (LOP).....	49
6.8. PS in Medical Education Curricula	50
6.9. Research on the Practice and Progress of PSC	50
APPENDIX A	52
APPENDIX B	62
REFERENCES.....	77

TABLES

Table

1. Demographic and professional characteristics of physicians in public hospitals in Lebanon in 2020 (N= 111).....	52
2a. Organizational factors regarding patient safety (PS) as reported by physicians in public hospitals in Lebanon in 2020 (N= 111).....	54
2b. Physicians who reported the presence of audit and orientation in the public hospitals where they practice in 2020	55
3. Patient Safety (PS) knowledge and culture among physicians in public hospitals in Lebanon in 2020 (N=111)	56
4. Compliance with the International Patient Safety Goals (IPSG) by personal characteristics as reported by physicians in public hospitals in Lebanon (2020) (N=11)	57
5. Compliance with International Patients Safety Goals (IPSG) by organizational characteristics as reported by physicians in public hospitals in Lebanon (2020) (N=11)	58
6. Compliance with the International Patient Safety Goals (IPSG) by knowledge and cultural characteristics as reported by physicians in public hospitals in Lebanon (2020) (N=11)	59
7. Compliance with the International Patient Safety Goals (IPSG) by personal characteristics of physicians, and PS knowledge and culture in public hospitals in Lebanon where they practiced in 2020: Multivariate linear regression model (N=111)	60
8. Medical errors eer witnessed but not reported by physicians in public hospitals in Lebanon, in 2020 (N=111)	61

ABBREVIATIONS

PS – Patient Safety
PSC – Patient Safety Culture
IPSG – International Patient Safety Goals
MOPH – Ministry of Public Health
IOM – Institute of Medicine
JCI – Joint Commission International
WHO – World Health Organization
EMR – Eastern Mediterranean Region
KSA – Kingdom of Saudi Arabia
HSOPSC – Hospital Survey on Patient Safety Culture
ISMP – Institute for Safe Medical Practices
HAS – French National Authority for Health
CME – Continued Medical Education
SPH – Syndicate of Private Hospitals
LOP – Lebanese Orders of Physicians
RHUH – Rafik Hariri University Hospital
AHRQ – Agency for Healthcare Research and Quality
IRB – Institutional Review Board
ANOVA – Analysis of Variance
SPSS – Statistical Package for the Social Sciences
SD – Standard Deviation

CHAPTER 1

INTRODUCTION

1.1.Presentation of the Issue

Patient safety (PS) remains a paramount concern within the global healthcare landscape. Estimations from the World Health Organization (WHO) suggest that 1 in 10 patients suffers harm during hospital care. The repercussions of such incidents result in extended hospital stays, long-term disabilities, potential fatalities, and a substantial financial burden on healthcare infrastructures ¹. An initial report by the US Institute of Medicine (IOM) in 1999 titled “To Err is Human: Building a Safer Health System” called for a comprehensive approach to improving PS culture (PSC) ². Within such a culture, healthcare practitioners prioritize PS and are motivated to report any adverse occurrences ². Among healthcare practitioners, physicians, by virtue of their central role in healthcare, have a major direct and indirect influence on PS. Their knowledge and practices shape the safety culture and the prevention of adverse events. Challenges like insufficient training and workload pressures can impede their proactive involvement in PS ³.

The Ministry of Public Health (MOPH) in Lebanon has incorporated certain PS standards in the hospital accreditation system. Nevertheless, significant gaps exist pertaining to the evaluation of compliance with PS among various stakeholders in general and among physicians in particular. This research aims to bridge the chasm by evaluating PS knowledge, attitudes, practices, and their determinants among physicians in Lebanese

public hospitals. The findings will offer valuable insights for enhancing PS in all hospitals, with an emphasis on public institutions.

1.2.Aims and Objectives

In Lebanon so far, research has not examined physicians' perspectives in depth, despite their crucial role in driving the institutional structure towards more commitment to PSC. This survey aims at generating evidence that can be used in improving policies and practices in priority areas to promote physician's engagement in the emerging culture of PS.

The objectives of this survey are:

1. To assess knowledge of International Patient Safety Goals (IPSG), PSC conception, and adherence with IPSG among physicians in public hospitals in Lebanon.
2. To measure factors associated with the adherence of physicians to IPSG.
3. To analyze patient safety event (PSE) reporting patterns among the surveyed physicians.

1.3.Research Questions

2. What are personal and institutional characteristics affecting compliance with IPSG?
3. Do physicians in urban-based public hospitals have superior PS knowledge and practices compared to their counterparts in rural areas?
4. Which part of the routine practice of safety culture impacts positively on compliance?
5. How do physicians perceive the occurrence of medical errors in the hospital?

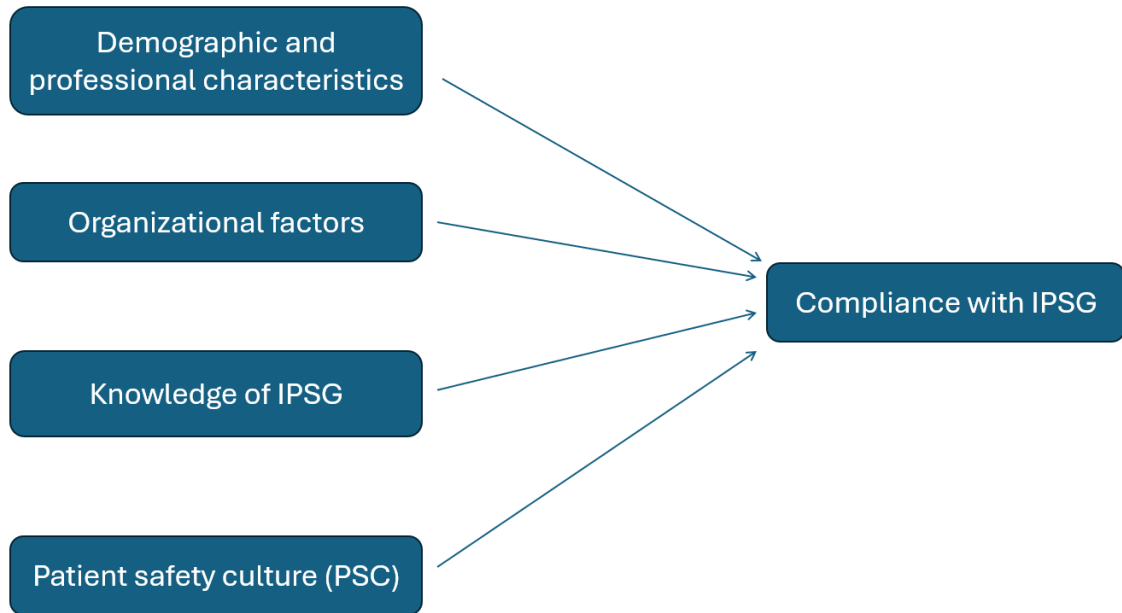


Figure 1. Conceptual Model

CHAPTER 2

LITERATURE REVIEW

International Patient Safety Goals (IPSGs) were established in the early 2000s by the Joint Commission International (JCI) to help accredited hospitals address specific priority areas of PS and reduce medical errors⁴. “The key merits of IPSGs include their specificity, global applicability, and the fact that they are updated regularly to address emergent issues in PS based on analysis of reported incidents, sentinel events, root cause analyses, and feedback from practitioners. These updates ensure that IPSGs remain relevant and responsive to the changing dynamics of healthcare provision”⁴. The current set of IPSGs focuses on 6 areas of PS: patient identification, communication, high-alert medications, wrong-site/patient/procedure surgery, healthcare-associated infections, and falls.

While IPSGs provide critical, tangible targets for improving PS, they reach their full potential when embedded within a robust PS Culture (PSC). IPSGs and PSC are therefore complementary, with the former providing evidence-based tools for specific risks, and the latter creating an environment for maximizing adherence and impact. Therefore, PSC pertains to the broader organizational environment and attitudes that influence behaviors related to PS. It encapsulates “the norms, values, and routines shared by members of a healthcare institution regarding the safety of patient care”⁵. PSC goes beyond specific protocols and standards to address the underlying ethos of an organization. The strengths of emphasizing PSC include promoting a culture of openness where medical errors are freely reported and analyzed without blame, fostering inter-professional collaboration, and

continuously adapting to improve patient outcomes ². Historically, errors were individualized, and blame was attributed, but modern approaches emphasize systemic solutions, ensuring that mistakes are either prevented or not dismissed. The new PSC outlined by WHO in 2019, entails a concerted effort to avert any harm to patients due to healthcare processes. Central to this notion are the comprehension of errors, risk minimization, learning from mishaps, and fostering a safety-focused environment within healthcare institutions ^{1,2,6}.

Policies and checklists play an important role in translating the concepts of PS culture into practice. The establishment of clear, actionable policies provides a foundational framework for healthcare institutions to train healthcare workers and evaluate the outcomes of that training. To facilitate this process, WHO's "Global Patient Safety Action Plan 2021-2030" provides an evidence-based roadmap to guide the promotion and integration of PSC across health systems worldwide ⁷. It is intended to influence PS policies, governance, behaviors, and norms at national and facility levels globally. Another notable example is the "Speak Up for Patient Safety" program, which empowers patients and families to actively engage in their care by clarifying doubts and understanding medical procedures ⁸.

In translating policies into action, checklists have received high marks for their potential to significantly reduce medical errors, especially in areas prone to human forgetfulness or oversight. For instance, the "Surgical Safety Checklist", developed by WHO in 2007, has been instrumental in diminishing morbidity and mortality rates in surgeries worldwide. It serves as a simple yet effective tool that enforces adherence to critical safety steps, ensuring that every patient receives consistent and safe surgical care ⁹.

Furthermore, the "Medication Safety Self-assessment" checklist developed by the US Institute for Safe Medical Practices (ISMP) offers a structured approach for institutions to evaluate their medication practices, identifying areas of strength and improvement ¹⁰.

The Eastern Mediterranean Region (EMR) has been comparatively slow in adopting PS measures. Research indicates that the state of institutional PSC in the Arab region is still emerging. A 2017 systematic review by Elmontsri et al. found limited studies on PSC available from Arab countries ¹¹. The existing studies point to areas needing improvement, such as teamwork, communication, leadership, incident reporting, and non-punitive environments when errors occur. The review included studies indicating low awareness of safety risks among patients and of their role in promoting safe care. The studies reviewed originated in specific hospitals and primary care centers across countries like Saudi Arabia, Jordan, Egypt, Kuwait, and Qatar. Few were national studies or included physicians. As such, their findings may not holistically represent the PSC landscape of the entire country. Nevertheless, a consistent theme emerging from these studies underscores the imperative for broader research and an intensified focus on PS culture. While a majority of studies were interested in nurses' PS issues, a few did actually focus on physicians' involvement ¹¹.

In the Kingdom of Saudi Arabia (KSA), a large range of studies have been conducted across various healthcare settings to evaluate the PS culture (PSC) as perceived by different healthcare professionals, including nurses and physicians. A 2014 study examined the PSC in a large teaching hospital in Riyadh, consisting of physicians, nurses, clinical and non-clinical staff, pharmacy and laboratory staff, dietary and radiology staff, supervisors, and hospital managers. The study identified strengths in organizational

learning and teamwork. However, non-punitive responses to errors and staffing were areas of concern, with a significant number of staff not reporting any events ¹². In 2017, a survey in a tertiary care teaching facility in Riyadh, including physicians, registered nurses, other clinical or non-clinical staff, pharmacists, laboratory technicians, dietary department staff, radiologists, and administrative staff including managers and supervisors, showed significant improvement in PS culture over three years. The study highlighted the need for improvement in staffing and non-punitive responses to errors ¹³. Subsequently, a 2018 study assessed the views of 351 nurses in three government-owned general hospitals in the central region. The study revealed that teamwork and organizational learning were strengths, whereas handoffs and transitions were among the identified weaknesses ¹⁴. In the same year, another study assessed PSC in an adult oncology department with 127 respondents, including nurses, doctors, and pharmacists, from a public hospital. The study found that no aspect of PSC received a rating above 70%, with significant differences in perceptions across professional groups, suggesting areas needing substantial improvement, especially in management support for PSC and non-punitive response to error ¹⁵. In 2019, a survey of 255 healthcare professionals, including nurses, physicians, and administrators from four major hospitals in the Hail region. The study found a positive perception of the "Patient Safety Grade" and identified communication and event reporting as areas for improvement, with a high rate of non-reporting of incidents ¹⁶. Another survey included 181 healthcare practitioners in a 150-bed general hospital in the central region of Saudi Arabia. The majority were caring assistants, and nurses, and a smaller percentage of physical, occupational, or speech therapists, and medical doctors. The study identified weaknesses in PSC. These included management support for PS, teamwork across units,

frequency of events reporting, communication openness, overall perception of PS, and supervisor/manager expectations. It also found that working hours per week and staff position were significant predictors of PS culture perceptions ¹⁷

More recently, in 2020, an analysis across five hospitals in the Qassim Region involved 1460 staff members including nurses, physicians, pharmacists, allied health professionals, and administrative staff). it found that teamwork within units was a strength, whereas non-punitive response to errors needed improvement. Newly hired staff and pharmacists had the lowest perceptions of PSC ¹⁸.

In 2021, a study in primary healthcare centers in Al-Ahsa, included 288 medical staff, mostly nurses and technologists/ technicians. The results indicated a positive attitude towards PS culture, with job satisfaction and teamwork receiving the highest total score. However, working conditions received a lower score ¹⁹. In the same year, a survey at Riyadh's King Fahd University Hospital involved 600 healthcare workers. The majority were registered nurses and respiratory therapists, with minimal physician participation. The hospital excelled in organizational learning, feedback, and communication about errors but had low scores in staffing and teamwork within units ²⁰.

Focusing on 184 nurses from King Khalid Hospital in Jeddah, a 2023 study highlighted strengths in teamwork and organizational learning, with weaknesses in handoffs and staffing. A significant proportion of nurses had not reported any PS incidents ²¹. A national descriptive study in 2023 covering 366 hospitals from various healthcare sectors (MOH, government non-MOH, and private) found that better PSC scores were associated with fewer reported sentinel events ²². Teamwork, communication, and handoffs were significant predictors of sentinel events. The study concluded that to minimize the

occurrence of sentinel events and improve overall PS, “there is a need for culture change to promote a blame-free culture and improve teamwork, handoffs, and communication openness”²². Lastly, a 2023 study involving 204 healthcare workers from three different hospital settings: government, quasi-government, and private hospitals in Riyadh, Saudi Arabia. The participants included a mix of healthcare providers such as nurses, physicians, and various administrative and support staff. The study reported a generally low level of awareness of PS culture (PSC) among healthcare workers across ten dimensions of PS and called for interventions like error reporting systems, safety huddles, and leadership walkarounds to establish a more robust PS culture²³.

In Egypt also, several studies involved PS culture and practices. In a 2011 study involving 148 nurses from two university hospitals in Cairo, Egypt, the findings revealed a generally positive perception of PS culture among nurses. The study identified significant differences in perceptions between nurses working in different units and positions²⁴. Following this, a 2012, survey at Ain Shams University hospitals, in Cairo, engaged 510 healthcare providers, including physicians, nurses, pharmacists, technicians, and laborers. Their public teaching hospitals exhibited high scores in organizational learning and teamwork but low scores in non-punitive response to error²⁵. In the same year, another study researched 400 healthcare providers, including physicians, nurses, and paramedical personnel from Cairo University Teaching Hospitals. Physicians displayed the most significant positive safety culture scores, contrasting with lower scores among nurses and paramedical personnel²⁶. By 2015, a survey involving 328 staff members (physicians, nurses/ midwives, and health officers) from primary healthcare facilities in Alexandria, identified a median PS culture score of 68.6%. The study recommended improving PS

culture as a priority among health center administrators ²⁷. In 2017, explored the perceptions of 423 healthcare workers including physicians, nurses, technical staff, and non-medical staff at Beni-Suef University Hospital. A low perception of PS culture was reported, highlighting the need for training and a blame-free reporting system ²⁸. In 2018 a survey at the Tanta University Hospital, encompassed various healthcare workers, including physicians, nurses, technicians, and other staff. Significant differences were noted between healthcare workers' perceptions across different dimensions of PSC, with experience and direct patient contact influencing these perceptions. The results suggested a need for improvement in non-punitive responses to errors to enhance the overall safety culture in the hospital units studied ²⁹. In 2019, a study in urban and rural primary healthcare facilities in Giza, with a team of 130 healthcare workers of physicians, nurses, and pharmacists. Job satisfaction was the highest-rated safety attitude dimension, while ambulatory care was the lowest ³⁰.

In 2019, a study of 60 nurses in two ICUs (pediatric and adult) at Kasr Al Ainy University Hospital, found an average positive response to PS culture items ranging from 6% to 51%, indicating a fragile PS environment ³¹. In 2020, PS culture among 479 paramedical healthcare workers, including nurses, pharmacists, and technicians. in general, and district hospitals in Fayoum Governorate, Egypt. These public hospitals showed low PS scores, necessitating continuous monitoring, and a better incident reporting system ³². in 2020, focused on 72 physicians and nurses in the ICUs of Alexandria's University Hospital. PSC was found to be weak, particularly in non-punitive responses to errors ³³. In 2022, conducted a study with 66 participants, including residents, assistant lecturers, and head nurses, at a university hospital in Alexandria. The results displayed a frail PS culture, with a

significant need for improvement in non-punitive response to errors ³⁴. In 2022, assessed the perceptions of 146 nurses in an Egyptian university hospital. Nurses reported a high perception of PS culture and a low incidence of safety events reported yearly ³⁵. In 2022, 240 healthcare workers (physicians, pharmacists, dentists, nurses, and technicians) at different levels of healthcare in Sharqia Governorate. The safety climate had the highest percentage of positive responses, and the study underscored the need for improvement across all PS composites ³⁶.

In Jordan, in 2014 studied the impact of educational interventions on 57 senior nurses in a specialized hospital in the middle region of Jordan. Post-intervention, there was a significant increase in positive responses regarding the frequency of event reporting and non-punitive responses to errors, indicating an improvement in the safety culture ³⁷. In 2015 a study with 658 nurses in 21 hospitals in the Middle Region and Northern Region of Jordan. The research did not specify the hospitals' locations or whether they were public or private. The study highlighted an overall strong suit in teamwork within units, while communication openness and staffing were perceived as needing significant enhancement ³⁸. Another study in 2015 focused on the perceptions of 242 registered nurses from five hospitals: two governmental, two privates, and one teaching hospital. The study revealed moderate positive responses to safety culture, with a notable deficit in staffing and non-punitive responses to errors ³⁹. in research 2016 with 287 healthcare professionals, including physicians, nurses, pharmacists, dieticians, physiotherapists, laboratory specialists and technicians, and radiologists and technicians, from three public hospitals in Jordan showed a disparity in safety culture perceptions. The highest positive response was observed in teamwork within units, but there was a notable concern with the non-punitive

response to errors and the overall perception of PS ⁴⁰. A study in 2017, analyzed the perspectives of 391 nurses from seven hospitals, two private, three Ministry of Health (MOH), and two university hospitals. The findings indicated a variation in the perception of safety culture across different institutions, with the highest score in teamwork within units but significant areas needing improvement, such as non-punitive response to errors and staffing ⁴¹. In a 2020 cross-sectional study, 644 nurses from all 91 accredited primary healthcare centers in Jordan were surveyed. The study aimed to understand the attitudes towards PS culture in primary care settings. The results suggested a satisfactory level of job satisfaction but a need for improvement in areas like management perceptions and stress recognition ⁴². In 2022 explored the impact of collaboration between physicians and nurses on safety culture across four different hospital settings in Jordan: university, not-for-profit, private, and governmental. This study comprised 559 participants, including nurses, nurse managers, and physicians in four nationally and internationally accredited hospitals. They found a positive correlation between physician-nurse collaboration and PS culture, especially in not-for-profit hospitals ⁴³. A 2022 study included 424 emergency room nurses from both government and private accredited hospitals in the northern, central, and southern regions of Jordan. The results showed a need for improvement in PS culture, with strengths identified in teamwork within units and organizational learning, contrasting with lower scores in event reporting and handoffs ⁴⁴.

In Qatar, a study in 2018 employed a mixed-methods approach at the Hamad Medical Corporation, involving 1,604 healthcare professionals, including nurses, doctors, and pharmacists. The research revealed critical areas for improvement in PSC, particularly regarding non-punitive responses to errors and staffing levels. The study's thematic analysis

pointed to a need for organizational and strategic interventions to enhance PS culture rather than solely focusing on individual behaviors ⁴⁵. A study in 2021 reported on two serial surveys conducted across all 21 health centers of the Primary Health Care Corporation in Qatar. Nurses made up the majority of participants in both the 2012 and 2015 surveys. The study assessed the impact of quality improvement initiatives on the PS culture. The results indicated statistically significant improvements across all dimensions of PS culture, showcasing the beneficial effects of accreditation and safety training ⁴⁶. In a comprehensive evaluation in 2022, 5583 employees from the Hamad Medical Corporation's secondary and tertiary public hospitals participated. It included hospital employees, national ambulance services, home care services, and clinical support departments. The study, which used the Hospital PS Culture Survey (HSOPSC), revealed a moderate overall positive response rate of 62.4%, with a notable 88% of respondents being in direct patient contact roles. The findings underscored strong teamwork within units but pointed out challenges in areas like communication openness and staffing ⁴⁷. Finally, in 2023, a descriptive cross-sectional study at a large tertiary referral hospital in Doha focused on the perceptions of PSC among the nursing staff. With the participation of 212 staff nurses, the study revealed a predominantly positive outlook on PSC, with particular strengths in continuous improvement and quality of events reporting. However, areas such as "trust" and "balance" were identified as needing further enhancement ⁴⁸.

In Oman in 2014, a study focused on 414 registered nurses working in various departments of four major governmental hospitals in Muscat, Oman. This research highlighted the highest positive scores in PS culture dimensions such as teamwork within units and organizational learning. Conversely, it noted lower scores in areas like non-

punitive response to error and staffing. The study suggested that experience and working in teaching hospitals correlated with a higher perception of PS culture ⁴⁹. Another 2014 study involved 390 health workers, including nurses, physicians, and technicians, from five secondary and tertiary care hospitals in the northern region of Oman. This study, too, focused on public hospitals. It revealed an overall moderate positive response rate to PS culture dimensions, with the highest scores in organizational learning and teamwork within units. However, there were low scores in hand-offs and transitions, staffing, and non-punitive responses to errors, indicating areas needing improvement ⁵⁰. A study in 2019 surveyed 186 health professionals, including nurses, physicians, radiographers, laboratory technicians, dentists, and pharmacists, in 22 primary public health care centers in Muscat. The study found a strong sense of teamwork within units and high rates of organizational learning and teamwork across units. However, areas like communication, non-punitive response to errors, and patient transfer protocols required improvement ⁵¹. A study in 2019, targeted 892 doctors, nurses, and midwives in ten maternity care units in Oman's public hospitals. With a response rate of 82%, the study found that the overall positive safety responses in hospitals ranged from 53% to 66%, below the targeted 75%. Job satisfaction was rated highest, while stress recognition was lowest. This study emphasized that the safety culture in Oman's maternity units needs considerable improvement, with some units exhibiting significant variations that could provide insights into enhancing safety culture ⁵².

In Kuwait, a national study in 2018 surveyed 12,092 employees from 16 public hospitals, including a majority of nurses and physicians. The study, set in public hospitals varying in size across Kuwait, identified strengths in teamwork, organizational learning, and management support for PS. It also highlighted a significant association between PS

outcomes and safety composites, with performance comparable to or better than regional and international benchmarks ⁵³. In 2018, a study examined PS culture in a general hospital medical department in Kuwait. This study had 1,008 respondents, mainly nursing staff, technicians, and physicians. It identified areas needing improvement, such as non-punitive responses to errors, staffing, and communication openness, and found that teamwork within units and organizational learning were areas of strength ⁵⁴. Another 2020 study involved 20 healthcare professionals, including physicians, clinical pharmacists, nurses, and members of the PS committee, from two major hospitals in Kuwait. This qualitative study revealed three major themes affecting PS culture: management, regulations and policies, and healthcare professionals. Despite the positive attitudes and knowledge towards PS, the study identified various barriers, were identified, such as support, staffing, resources, and error response ⁵⁵. In 2021, a study that included 6,602 staff from 100 primary care centers, encompassed a diverse range of clinical, allied, administrative, and managerial staff. Conducted in public primary care centers, the study highlighted strengths in teamwork and organizational learning but pointed out areas needing improvement, such as communication about errors, overall perceptions of PS, and work pressure ⁵⁶.

In Lebanon, despite the conspicuous lack of a national adverse event reporting system, there has been progress in implementing PS items in the accreditation standards and in assessing the prevailing safety culture ⁵⁷. A notable but lone contribution to the evaluation of PSC in hospitals in Lebanon was conducted in 2010. This study pinpointed strengths but also highlighted areas of potential improvement, especially concerning event reporting and staffing ⁵⁸. This survey was the first national PSC assessment across 68 private hospitals, but not public hospitals, in Lebanon. With over 6,800 respondents, the

study utilized the Hospital Survey on Patient Safety Culture (HSOPSC) as its primary assessment tool ⁵⁸. Findings revealed that while areas like teamwork within hospital units and organizational learning were viewed positively, there were concerns regarding staffing, communication openness, and fear of punitive response to error reporting. Alarming, approximately 60% of respondents reported not completing any error reports in the preceding year, when they should have done so. The study provided insights into PSC but did not examine specific occupational groups like physicians. A follow-up study in 2011 examined correlations between safety culture predictors and outcomes. Strong leadership, communication, event reporting, staffing, and accreditation status were associated with more positive safety perceptions and higher reporting of adverse events. This reinforces the importance of routine inclusion of PSC issues in the daily activities of any healthcare facility ⁵⁹.

2.1.Hospital Survey on Patient Safety Culture (HSOPSC)

The Hospital Survey on Patient Safety Culture (HSOPSC) is a well-established instrument developed by the Agency for Healthcare Research and Quality (AHRQ) in the United States. This diagnostic tool is designed to gauge the safety culture of a hospital at both the unit and hospital-wide levels ⁶⁰. The HSOPSC comprises several items grouped into composite dimensions that encompass various aspects of PSC. These dimensions include communication openness, feedback and communication about errors, frequency of events reported, handoffs and transitions, management support for PS, non-punitive response to error, organizational learning, overall perceptions of PS, staffing, supervisor/manager expectations and actions promoting safety, and teamwork within units

and across hospital units ⁶¹. The HSOPSC is a pivotal tool in the PSC landscape as it offers a structured means to assess the current state of PSC within a hospital. By probing into specific domains that influence safety culture, the survey provides a comprehensive view of areas of strength and those that demand attention. The HSOPSC is one of the most widely used and rigorously validated tools for the standardized assessment of PS culture in hospitals worldwide. It has been widely adopted globally, translated into several languages (Arabic, Japanese, Norwegian, Turkish, and Dutch), and increasingly used in research to evaluate and compare PS culture across hospitals ^{58,62-66}.

CHAPTER 3

METHODS

3.1. Study Design

This study is a secondary data analysis from a previous survey conducted with various types of healthcare workers in public hospitals in all areas of Lebanon in 2020-2021. A previous paper focused on PS dimensions among nurses ⁶⁷. This analysis will now be particularly focused on physicians.

3.2. Target Population

The target population is physicians working in all 28 public hospitals under the supervision of MOPH, across all regions of Lebanon (MOPH 2018).

3.3. Sampling Procedures and Inclusion Criteria.

Hospitals considered for this analysis are geographically dispersed, with 13 situated in urban/suburban regions and 15 in semi-rural/rural zones. Two public hospitals opted out of the survey due to the COVID-19 crisis. An exhaustive approach targeted all physicians in these hospitals. To be included, physicians must have served in the same hospital for a duration exceeding six months and must have been available on the hospital premises on the survey date. The rationale behind the six-month criterion is to ensure that physicians have adequate exposure to their department and hospital protocols, working environment, and orientation initiatives. No exclusion criteria were applied.

3.4. Survey Tool

The primary data collection tool was a self-administered questionnaire (Appendix B). This tool combined questions from the Hospital Survey of PS Culture (HSOPSC) focusing on institutional practices and behaviors⁶¹ and knowledge of the International PS Goals as stated in the JCI hospital accreditation standards⁶⁸. Initially drafted in English, the questionnaire underwent translation to Arabic with the assistance of experts in healthcare accreditation standards and PS. A back translation was performed by the American Language Center to validate the translation's accuracy. Both English and Arabic versions underwent expert review to ascertain their relevance, comprehensiveness, and clarity, with subsequent adjustments made as necessary.

The finalized questionnaire comprises four sections:

- i. The inaugural section evaluates personal and professional attributes, hospital variables, and organizational factors, such as gender, experience, work area, accreditation level, and presence of a PS committee.
- ii. The subsequent section delves into PS culture using the HSOPSC. It evaluates dimensions like teamwork, response to error, and communication openness.
- iii. The third section assesses physicians' knowledge of and compliance with IPSG, founded on JCI and Lebanese hospital accreditation standards, spanning the requirements on six sets of goals.
- iv. The concluding section enquires about the nature of medical errors observed by the surveyed physicians in 2019 and the hospital's PS rating.

3.5. Definition of Variables

Responses were obtained using varied methods, depending on the nature of the variables:

- A 5-point Likert scale for attitude and opinion questions.
- Dichotomous (Yes/No) response for factual or activity-related queries.

3.5.1. Dependent Variables

The dependent variable of the study is self-reported compliance with IPSTG. The questionnaire highlights six key areas as follows:

i. Patient Identification

Ensuring HCWs adhere to policies for confirming patient identities, such as verifying patient IDs before medical procedures, labeling samples immediately after collection, and educating patients about using two forms of identification. This section includes four questions.

ii. Effective Communication

Involves HCWs adhering to guidelines for documenting, reiterating, and confirming verbal or phone orders, following a standardized list of medical abbreviations, and utilizing proper communication tools during patient handoffs. This section has three questions.

iii. Safety of High-Alert Medications

Focuses on HCWs' adherence to protocols for handling dangerous drugs, including preparation by two registered nurses, secure storage, and patient education on usage and side effects. This also consists of three questions.

iv. Correct Patient Procedure & Surgery

Emphasizes HCWs' compliance with protocols to ensure correct surgical sites and procedures, use of safe surgery checklists, and completing these checklists for each surgery. This part contains three questions.

v. Prevention Of Hospital-Acquired Infection

Involves adherence to handwashing, use of personal protective equipment, and completion of necessary forms as per international Infection Control Bundles. This section includes four questions.

vi. Patient Fall

Relates to the implementation of fall-risk assessments at patient admission and subsequently as needed. This area contains one question.

Compliance with IPSG is measured using a five-point Likert scale, ranging from 1 (Rare) to 5 (Always). Scores for each item are calculated, and a composite overall score is derived by summing these individual scores, creating a continuous scale from 0 (total non-compliance) to 90 (complete compliance).

3.5.2. *Independent Variables*

3.5.2.1. Knowledge Of IPSG

This variable details physicians' understanding of the International Patient Safety Goals (IPSG) and Joint Commission International (JCI) standards. Their knowledge is crucial for achieving desired PS outcomes in hospitals. This comprehension is evaluated across six IPSG areas:

i. Patient Identification

Examines healthcare workers' (HCWs) knowledge about the first IPSTG, including procedures for attaching/removing patient identification bracelets, correctly identifying different types of patients (conscious, unconscious, unknown, and newborns) before each care interaction, using two unique identifiers (excluding patient room number) during the hospital stay, and correct actions upon finding errors in identification bracelets. This area includes 11 questions.

ii. Effective Communication

Assesses HCWs' understanding of the second IPSTG, focusing on verbal and telephone orders, critical test results communication, and patient handover processes. This also comprises 11 questions.

iii. Safety Of High-Alert Medications

Evaluates knowledge concerning the third IPSTG, addressing the handling of dangerous medications, including their location, labeling, storage, and administration, as well as medication reconciliation to verify patients' medication lists. This section has 5 questions.

iv. Correct Patient Procedure & Surgery

Measures HCWs' knowledge about the fourth IPSTG, including preoperative verification, surgical site marking, timeout procedures, and safe surgery checklists. This includes 4 questions.

v. Prevention Of Hospital-Acquired Infection

Gauges understanding of the fifth IPSPG, which involves reducing healthcare-associated infections through practices like following hand hygiene guidelines, using personal protective equipment, and patient isolation. This section contains 12 questions.

vi. Patient Fall

Tests knowledge about the sixth IPSPG, focusing on reducing patient harm from falls in inpatient settings, like using a fall risk scale and marking at-risk patients. This includes 3 questions.

Staff knowledge of IPSPG is measured through multiple-choice questions, scored as 0 for an incorrect answer or "don't know", and 1 for a correct answer. The total correct scores for each goal are calculated, and a composite overall score is derived from the summation of these six total scores, ranging from 0 (complete lack of knowledge) to 94 (full knowledge).

3.5.2.2. Patient Safety Culture

The concept of PS culture involves how physicians perceive safety within their hospitals. This perception is shaped by organizational factors as well as personal/professional variables and structural characteristics of the care settings.

3.5.2.2.1. Organizational Factors

i. Teamwork

Highlights the capacity of healthcare workers (HCWs) to collaborate effectively, especially during peak times, supporting one another. The survey contains 3 questions related to this aspect.

ii. Response to Error

Deals with HCWs' comfort in reporting adverse events and the supportive environment for those who make mistakes, focusing on learning from errors. This is explored through 4 questions in the survey.

iii. Communication openness

Assesses if staff members are comfortable voicing concerns about safety or asking questions, gauged by 4 questions in the questionnaire.

iv. Reporting Patient Safety events

Involves the reporting practices of HCWs regarding errors, both those intercepted before impacting the patient and potential errors that did not cause harm. This is addressed in 2 survey questions.

v. Staffing and work pace

Pertains to having adequate staff for the workload, ensuring reasonable working hours without undue pressure, and the use of temporary or PRN staff. It includes 4 questions in the questionnaire.

vi. Organizational learning through continuous improvement

Focuses on the routine evaluation and improvement of work processes to prevent repeat errors. There are 3 questions regarding this in the survey.

vii. Supervisor, manager, or clinical leader support for patient safety

Evaluates the extent to which leadership values HCWs' input on safety improvements, avoids shortcuts, and proactively addresses safety issues. This is covered by 3 questions.

viii. Communication about error

Measures how hospital management communicates with HCWs about errors, discusses error prevention, and informs about changes. It includes 3 questions.

ix. Hospital management support for patient safety

Reflects the priority given to PS by hospital management, including resource allocation. This aspect is explored through 3 survey questions.

x. Handoffs information exchange

Relates to the transfer of critical patient information between hospital units and during shift changes, assessed by 3 questions.

xi. Overall Perceptions of Patient Safety

Assesses how staff view their work area and the hospital in terms of PS on a 5-point Likert scale, from 1 ('failing') to 5 ('excellent').

Data were collected using Likert scales (ranging from 1 = 'strongly disagree' to 5 = 'strongly agree', or 1 = 'never' to 5 = 'always'). Scores for each item were tallied, and a composite overall score was calculated, ranging from 0 (no presence of PSC) to 160 (optimal PSC).

3.5.2.2.2. Personal and Professional Characteristics:

- Age: Assessed in years.
- Gender: male or female.
- Domain of medical activities: medical/surgical services or intensive care units.
- Medical schools: Differentiated between public and private institutions.
- Patient Safety Courses: Determined if participants had such courses during their training, using 0 for 'No' or 'Don't know' and 1 for 'Yes'.
- Years of Work Experience: Evaluated in terms of duration both at the current hospital and overall in the profession.

3.5.2.2.3. Hospital Characteristics:

- Hospital Type: Divided into general or university (referral or tertiary center).

- Location: Distinguished as rural (including semi-rural) or urban (including suburban).
- Accreditation Level: Ranging from the highest (A) to the lowest (D), including non-accredited.
- Structures of patient safety: seven elements of PS in the hospital are assessed through 7 dichotomous questions:
 - * Presence of a Patient Safety Committee.
 - * Appointment of Patient Safety Officer(s).
 - * Implementation of a Patient Safety Program.
 - * Regular Patient Safety Surveys.
 - * New Employee Orientation in PS.
 - * Conducting Patient Safety Audits.
 - * Provision of Patient Safety Training.

3.5.3. Other Related PS Outcomes and Indicators

These questions measure the dimensions of events reports as experienced by respondents.

3.5.3.1. Reported Errors in the previous year

Latent errors, accidents, and near misses as recalled by respondents.

3.5.3.2. Unreported Witnessed Medical Errors:

Measured as 0 for 'Never happened' or 'Unsure' and 1 for 'Happened at least once.

3.6. Ethical Considerations

This study is a secondary analysis of data from a primary study that was conducted under the approval granted by the Institutional Review Board (IRB) of the American University of Beirut. Prior to participation in the study, written informed consent was obtained from each physician. The consent form clearly outlined the study's purpose, procedure, potential risks, and benefits. Physicians were provided with complete information about the study, ensuring transparency about the objectives, methods, and potential implications of the research. The participants were also informed about their right to withdraw from the study at any point without any repercussions. The personal information and responses of all the participants were kept strictly confidential. No names or identifying details were recorded, ensuring that the data collected could not be traced back to any individual participant. Instead, unique identification codes were used to label the data. All collected data were stored securely, with electronic data being password-protected and hard copies stored in locked cabinets. Only authorized personnel had access to the study data.

3.7. Statistical Analysis

All variables were entered and described as frequencies and percentages for categorical variables; and means, standard deviations (SD), and ranges for continuous ones. The associations between each independent variable and the dependent one (IPSG

compliance) were examined using t-tests or ANOVA for continuous variables. Pearson correlation coefficients were calculated to determine the correlations between continuous variables and the compliance outcome. Finally, multivariate linear regression was conducted to adjust for independent effects of variables with significant bivariate associations on the outcome of interest. All associations were deemed significant if the corresponding test yielded a p-value ≤ 0.05 . The R^2 coefficient was also obtained to assess the percentage of variability in the outcome which could be explained by the independent variables remaining significant in the multivariate “best-fit” model. All analyses were conducted on the SPSS statistical package.

CHAPTER 4

RESULTS

The survey included 111 physicians, of whom 67% were men and 33% were women. The average age of the group was 34 years, with women significantly younger on average (30 years) compared to men (36 years), and over half of the group was single (55%) at the time of the survey. The majority were attending physicians (62.2%), with an average work experience of 11.5 years (SD=7). In their current practice, the respondents were distributed in university (48.6%) or general (51.4%) hospitals. Most work locations (62.2%) were in rural areas. The vast majority were accredited at levels C and D (66.7%). Work hours varied, with only about 40.5% working 8 hours a day or less, and a majority (82.9%) alternating day shifts with night duties. About 65% reported the absence of PS training in their medical curriculum. Details regarding the personal and professional characteristics of the respondents can be found in Table 1.

Regarding organizational factors related to PS, 28% of physicians reported the presence of an office for PS and risk management in their hospital, and 32% stated that their hospital had established an integrated PS program. Furthermore, 15% indicated that their hospital had conducted a standardized survey of its staff to assess its PS culture, and 14% mentioned the existence of a periodic training program on PS in their hospital. Only 9 (8%) of participants reported that their hospital conducted periodic audits of the implementation of PS policies and procedures. Likewise, a mere 4 (4%) reported that the new employees' orientation program included PS policies and procedures. Details are presented in Table 2a.

A side analysis was conducted with the handful of physicians reporting audits of PS policies and/or the inclusion of PS in the orientation of new employees in their hospitals. Of nine respondents who mentioned the existence of a PS audit in their hospitals, some came from two rural hospitals in South Lebanon: Nabatieh (2/2 respondents) and Marjeyoun (1/12); and some others from urban ones like Beirut's Rafik Hariri University Hospital (RHUH) (5/12) and Tripoli (1/5). Those nine participants did not differ from all participants in sex distribution or in attending status. However, both in rural and urban hospitals, they were significantly older (32 years) than the total median age of 28 years, suggesting more seniority in their respective hospital's medical staff. Of four respondents mentioning PS as part of the orientation of new physicians, 1 practiced at the suburban hospital of Baabda. The fact that this respondent's answer differed from that of 33 other participants from that same hospital suggests that the answer may not have been completely valid. The other three respondents reporting PS orientation were from the Nabatieh hospital already mentioned above. Of those, two were also the same who had agreed on the presence of PS audit and were older than the physician reporting PS orientation (Table 2b).

Six dimensions of PS knowledge were assessed, each one covering specific aspects of the same dimension. For example, the "patient identification" dimension included 10 specific dichotomous questions. Eventually, all "knowledge" dimensions were summed up in one overall score. The overall mean was 60 on a scale of 0-100 (SD= 19.9). The dimension with the highest mean score was "patient identification". All other items were relatively lower. PS "culture" is the concept that is associated with the collective behavior of the healthcare team of which doctors are part. The same approach was used to assess the organizational "culture" supportive of PS. This variable was composed of ten

dimensions with responses obtained on a Likert scale and eventually summed up in an overall culture score. The overall mean of PS culture score across all ten dimensions was 60.6 (SD = 6.5) on a 0-100 standardized scale. The dimension with the highest mean score was the perception of “hospital management support for PS” (mean = 66.0). The dimension with the lowest mean score was “reporting PS events” (mean = 44.0).

The outcome variable for this analysis was the actual “compliance” of participants with IPSPG, with an overall score derived from six dimensions with Likert scale responses. The overall mean IPSPG compliance score across the six dimensions was 58.8 (SD = 10.7) on a 0-100 standardized range. Of those dimensions included in “compliance”, the one with the highest score was for “identification of surgical site” (mean = 71.3). The dimension with the lowest mean compliance was “infection prevention and control” (mean = 46). Details of questions composing each dimension in PS knowledge, organizational culture, and respondents’ compliance are available in Appendix B, and details of results can be found in Table 3.

In bivariate analysis, it was found that personal characteristics significantly associated with higher IPSPG compliance were: being an attendant (vs. a resident), having been exposed to PS training in the medical curriculum, working in an urban/suburban hospital (vs. a rural one), and working in day and night alternating shifts (vs. in day shifts only). Remarkably, there were no differences in compliance by gender, age, marital status, years of professional experience, type of hospital or its accreditation, or number of patients under care. Details are presented in Table 4.

Two of the four hospitals’ organizational characteristics remaining in the analysis were significantly correlated with the “compliance” outcome. These were the existence of

a dedicated PS/risk management office and the existence of periodic PS training in the hospitals. Having an integrated PS program established at the hospital and conducting staff surveys on PS culture did not show significant differences in reported compliance (Details in Table 5).

Physicians' overall knowledge of PS guidelines positively correlated with their compliance with recommended practices ($p < .001$). All the knowledge dimensions composing this score were also significantly associated with “compliance”. In contrast, neither the overall score of organizational culture nor its particular dimensions were associated with compliance. The only exception was “reporting PS events” with an inverse significant association whereby lower reporting was associated with higher compliance. Details can be found in Table 6.

All significantly associated variables found in the bivariate analysis were included in a multivariate analysis to assess their independent effects on IPSPG compliance among the surveyed physicians in Lebanese hospitals. The full multivariate model showed that several factors were significantly associated with higher IPSPG compliance scores. Physicians who were residents had higher compliance compared to attending physicians ($p = 0.04$). Hospitals located in urban or suburban areas had higher compliance compared to rural hospitals ($p < 0.001$). Physicians working only daytime shifts had higher compliance than those alternating between day/night shifts ($p = 0.001$). The presence of an office for PS and risk management was linked to better compliance ($p = 0.001$). Higher PS knowledge scores were also associated with better IPSPG compliance ($p = 0.01$). However, a higher frequency of PS events observed and reported was related to lower compliance ($p = 0.02$). The best-fitting regression model included the hospital location, work schedule, presence of

a PS office, PS knowledge score, and frequency of reporting events. This model explained 52.5% of the variance in IPSPG compliance (adjusted R² = 0.525). Details can be found in Table 7.

The study investigated medical errors ever witnessed but not reported by physicians in public hospitals in Lebanon in 2020. All 111 participating physicians had witnessed a medical error in the year before the survey, but the majority of physicians (66%) did not report the error(s). The most commonly unreported medical error was inappropriate medical diagnosis (70%), followed by a nosocomial infection in a patient (68%), error in laboratory test results (66%), patient fall (65% unreported), and error in patient surgery (65%). The medical error with the highest reporting rate was an error in patient identification (51%) and an error in radiology test results (49%). Details can be found in Table 8.

CHAPTER 5

DISCUSSION

This analysis, while focused on a small fraction of physicians working in public hospitals, offers crucial insights into the landscape of PS practice in Lebanon. As reported by participating physicians, there was a limited presence of institutional structures for PS and wide inconsistencies in the implementation of audits and orientation programs across the surveyed public hospitals. Compliance was highest in urban hospitals, often linked to a university, although some notable exceptions imply that urban location and university affiliation alone do not guarantee robust PS practices. For example, the rural public hospital in Nabatieh reported results at least as good as those of the largest public hospital RHUH, located in the capital city of Beirut. It is possible to conclude therefore that even smaller rural hospitals can achieve or exceed urban compliance levels, provided the physicians are highly invested and committed to maintaining compliance with international PS goals (IPSG). The Nabatieh physicians who reported the presence of PS audits and orientation programs in their hospital were significantly older, with a median age of 32 years, compared to the overall median age of 28 years for all participants. This age difference suggests that these physicians may be holding senior positions within their hospitals, potentially contributing to institutional compliance with safety guidelines. Furthermore, the overlapping reports from physicians in Nabatieh regarding both PS audits and orientation highlight a proactive stance toward PS within this specific hospital, showcasing it as a potential model for other smaller institutions aiming to strengthen their PS protocols. Results suggest that even smaller rural hospitals can achieve or exceed urban

compliance levels when physicians are highly invested and committed to maintaining compliance with IPSPG. These observations provide valuable insights into the potential for achieving high compliance with PS standards in less resourced settings. The data, although from a limited sample, underscore a crucial point: effective PS practices can be successfully implemented with adequate commitment and leadership, regardless of hospital size or location. Nonetheless, further research involving a larger sample size from these hospitals is necessary to confirm and validate these findings and further explore the specific factors contributing to successful PS implementation in varied settings.

As would be expected, factors like physician engagement, institutionalized prioritization of patient safeguards, and enforced protocols appear to be vital determinants of successful implementation, transcending the rural-urban divide. On the other hand, discrepancies in PS knowledge and practice between physicians underscore an urgent need for systematic professional education and stricter institutional monitoring to uphold PS norms across all public healthcare facilities in Lebanon, regardless of geographical location. It suggests a foundation upon which to build more comprehensive, standardized, and effective PS training and audit processes. Enhancing these practices could lead to a more uniformly high standard of patient care across Lebanon's healthcare system, irrespective of the hospital's location or the physicians' level of experience. Ensuring that all physicians, regardless of their age or seniority, are aware of, and engaged in such initiatives is crucial for promoting adherence to IPSPG throughout the healthcare system.

The significant association between the presence of a PS office and higher IPSPG compliance underscores the value of active monitoring and oversight mechanisms specifically targeting physicians. While all healthcare professionals play a vital role,

physicians are often looked upon as leaders in establishing and upholding PS standards within a hospital setting. When physicians feel that their practices are being consistently monitored and evaluated through formal channels like a PS office, they may be more inclined to maintain rigorous compliance. This accountability can foster a culture where physicians take personal responsibility for ongoing education, protocol adherence, and proactive reporting of safety incidents or lapses. Implementing robust monitoring systems targeted at the physician workforce could therefore be a powerful strategy to drive sustained improvements in overall PS practices across healthcare facilities. One avenue to ensure the existence and proper implementation of a PS culture in a given hospital may be associated with the accreditation process, as we recommend below.

The implementation of PS structures and protocols can be enhanced through an adequate accreditation process⁶⁹. In Lebanon, the Ministry of Public Health (MOPH) has the mandate for the accreditation and re-accreditation of both public and private hospitals. Historically, these accreditations focused predominantly on structural elements and services rather than outcomes and quality measures, highlighting the need for accreditation reform^{69,70}. Recognizing this gap, MOPH has comprehensively revised its hospital accreditation standards as of December 2022. Developed in collaboration with the French National Authority for Health (HAS) and national experts, the new standards place greater emphasis on quality management and clinical outcomes compared to previous versions⁷¹. Developed in collaboration with the French National Authority for Health (HAS) and national experts, the new standards place greater emphasis on quality management, PS processes, and clinical outcomes compared to previous versions⁷¹. The revised accreditation covers critical PS areas like medication management, infection prevention, surgical safety, and

high-risk situation management. Specific standards address safe medication prescribing, proper patient identification, preventing healthcare-associated infections, and safeguarding correct surgical sites/procedures. While earlier accreditation checklists looked primarily at structures, the updated approach incorporates process and outcome measures to drive continuous quality improvement ⁷¹.

The new scope of the accreditation process demonstrates MOPH's commitment to aligning Lebanon's healthcare system with international best PS practices. By strategically partnering with global accreditation bodies, MOPH is contextualizing advanced PS standards to the local setting. Effective implementation of these robust new standards can positively impact care quality and patient outcomes nationwide.

Besides institutional prioritization of PS, individual knowledge of IPSPG is also a crucial element in physicians' practices. It appears that physicians' normative role focusing on medical issues affected their knowledge and subsequent engagement with various non-medical practices with a direct impact on PS. For example, physicians demonstrated relatively higher knowledge in dimensions like "patient identification," which may be considered more intuitive or based on common sense. However, they exhibited comparatively lower knowledge, and subsequently lower compliance levels in dimensions more closely associated with nursing normative duties, such as infection prevention and control practices. Furthermore, it also appeared that doctors working only daytime shifts, during which nurses are expected to be more available, are less in touch with PS dimensions than those alternating schedules. Physicians working alternating shifts may at times find themselves in charge of non-medical tasks as well, increasing their exposure to various PS aspects. This occupation-based difference appears in the concomitant study of

PS among nurses in public hospitals ⁶⁷ that their level of knowledge and awareness is markedly higher than that of physicians, using the same measurement tools. Nurses receive comprehensive training on PS protocols for direct involvement in day-to-day patient care activities. Slightly adapted training protocols may also be developed for physicians. In fact, some hospitals have actually started implementing some PS awareness in their orientation programs as reported by residents in training and younger attending physicians.

When reporting errors with potential negative impacts on PS, physicians in this study appeared to disregard errors nearer to their own medical practices while possibly over-emphasizing those further away from the strict domain of medicine. For example, while all physicians have witnessed medical errors in their hospital practice, less than a third of them bothered to report any such events. Here too, there is very likely a tendency among physicians to rely on nursing staff for monitoring and reporting such events. The same tendency of reporting errors from radiology and laboratory more than reporting medical diagnosis and surgical errors further confirms the existence of a cultural bias in considering errors as a cause for blame, to be therefore covered up, rather than as a necessary step towards system quality improvement. In contrast, nurses working in the same context ⁶⁷ were more likely to report errors they had noticed such as wrong medication dosages, patients' falls, nosocomial infections, and pressure ulcers. The negative perceptions leading to lower compliance of physicians with PS may compose a crucial component of a potential program of continued professional education targeting physicians.

This study has several limitations that should be considered when interpreting the findings. Firstly, the inclusion criteria required physicians to be available on the hospital premises on the survey date. This convenience sampling approach could lead to selection

bias if the physicians present on the survey dates differed systematically from those who were absent, in terms of their PS practices, workload, or other relevant factors. Secondly, the sample size was relatively small, focusing on a limited number of physicians in public hospitals. While this allowed for a detailed analysis of PS practices within these facilities, the results may not be generalizable to all public hospitals, or the broader healthcare system in Lebanon. However, non-participants were randomly distributed across specialties and experience. Only two of twenty-eight public hospitals in “Dahr el Bacheh” in the hills north of Beirut and “Batroun” on the northern Mediterranean coast refused to allow access to the surveyors, not because of disagreement on the topic, but rather because of their overburdened situation with covid19 patients in their respective areas, at the climax of the pandemic in Lebanon. While a larger sample would have enhanced the power of the study, it is reasonable to consider that whatever data provided by the participants reflect in a large part the real state of affairs regarding PS in public hospitals. In fact, any limitation on the validity of findings may have resulted from physicians’ recall bias or social desirability bias. In this case, positive results are very likely overestimated while negative aspects would be under-estimated. Despite these potential limitations, this study provides valuable insights into the current state of PS practices in Lebanese public hospitals and identifies key areas for improvement. The findings can inform targeted interventions and policy initiatives as will be recommended below.

Public hospitals, as is well known, are only a minor component of the hospital sector in Lebanon, compared to private hospitals. PS in private hospitals was assessed over ten years ago ^{70,72}, showing concerns like understaffing, poor communication, and fear of punitive responses to error reporting. El-Jardali et al. found that rural private hospitals had

a more positive perception of safety⁵⁹, indicating that even in those areas the target population of patients in the private sector is relatively more affluent, and therefore more demanding of smooth quality services, compared to the relatively more tolerant poorer patients in public hospitals. On the other hand, difficulties related to staffing and workload which can affect PSC found in this analysis had already been identified by El-Jardali et al. as generating the same problems also in private hospitals⁵⁹. While competition incentivized private hospital progress, the public system serving economically disadvantaged populations may have lacked similar driving forces for change. Therefore, the public sector requires focused attention to address PS concerns through system-wide efforts to promote transparency, non-punitive error management, leadership commitment to PS and continuous monitoring of progress.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

Improvement is always required in the institutional and personal commitment of healthcare facilities and personnel to the safety of hospitalized patients. Progress may be obtained through concerted efforts of several stakeholders addressing the issue at different levels.

6.1. The Ministry of Public Health (MOPH)

MOPH's comprehensive revision of hospital accreditation standards, developed with the French National Authority for Health (HAS) and national experts ⁷¹, aligns Lebanon's healthcare system with international best practices in PS and quality. The inclusion of process/outcome measures promotes continuous improvement. To effectively leverage these revised standards, MOPH should Implement a training program with clear guidelines to facilitate adoption of the new requirements across healthcare facilities. Establish a robust monitoring and evaluation framework, with regular data analysis and feedback loops, to assess impact and identify areas for further enhancement. Foster collaboration among hospitals by creating platforms to exchange best practices, driving system-wide improvement. Encourage ongoing international cooperation to remain updated on evolving PS standards globally. By enacting these recommendations alongside the revised accreditation standards, MOPH can enhance PS, improve clinical outcomes, and elevate healthcare quality nationwide.

6.2. The Syndicate of Private Hospitals (SPH)

This association is influential in setting norms across the hospital care system in Lebanon. It can affect the public sector through the physicians who work in the two sectors and through the expectations that patients and their families come to recognize as standards of care in any hospital ⁷³. The SPH may also be called upon to play a social responsibility role, in supporting the PS training and awareness needs of public hospitals in their vicinity. SPH should encourage collaboration and knowledge-sharing between public and private hospitals to identify best practices and develop innovative solutions for improving PS outcomes through joint training programs, workshops, and the establishment of a national PS network. A successful example of such collaboration can be found in the United States, where an initiative in 2004 brought together hospitals, healthcare organizations, and PS experts to share best practices and implement evidence-based interventions to reduce preventable deaths in specific geographical areas. The initiative resulted in an estimated 122,300 lives saved over 18 months ⁷⁴.

6.3. Hospital Managers

This analysis' results clearly indicated the major role of the hospital's management and senior medical council in making a difference in PS, even in public rural facilities facing limited support and resources. This finding aligns with evidence from a study by El-Jardali et al., which highlighted the importance of leadership and management commitment in driving PS initiatives in Lebanese hospitals ⁵⁸. Managers can be motivated by accreditation requirements, as demonstrated by the successful implementation of PS practices in Lebanese hospitals that underwent accreditation ⁷⁵. Physicians should be

motivated by public reporting of PS improvements which may lead to larger attendance even from self-paying patients. A study by Ammar et al. (2013) found that Lebanese patients did indeed prioritize safety and quality of care when selecting healthcare providers⁷⁶.

Managers should strive to establish and maintain PS offices, committees, and regular training programs to ensure consistent adherence to IPSP among all healthcare professionals. Incorporating PS training into routine practice requires a cultural shift in healthcare organizations⁷². Hospital leadership plays a crucial role in driving this change by demonstrating commitment to PS through communicating objectives, providing resources, ensuring data collection and reporting, and prioritizing PS as a strategic goal⁷². Surveys and audits are regular activities which can encourage patients and their families to speak up about safety concerns, and doctors and nurses to report their feelings in all confidentiality without fear of blame or retribution. Dayekh et al. (2022) also emphasized that including families of patients in safety training, in addition to healthcare professionals, can result in measurable outcome improvements⁷⁷.

6.7. Lebanese Orders of Physicians (LOP)

LOP can be responsible for creating a special module in Continued Medical Education (CME) addressing PS issues from the particular point of view of physicians. a systematic review by Cervero and Gaines (2015) found that CME activities have a positive impact on physician performance and patient outcomes⁷⁸. LOP can require that a PS module is presented during the orientation of all physicians newly joining a hospital. This approach aligns with WHO recommendations in the "Global Patient

Safety Action Plan 2021-2030", which emphasizes the need for healthcare organizations to provide PS training to all healthcare professionals ⁷⁹. Including PS criteria in new doctors' orientation is already performed in some public as well as private hospitals as a voluntary step, under the influence of PS-related ISO requirements.

6.8.PS in Medical Education Curricula

The integration of physicians in training into the routine activities of the hospital in general and in PS practices, in particular, is often left to the informal diligence of senior attendants and the nursing body. Formal education in medical schools should have prepared them to face these real-life issues and be ready to implement an adequate course of action, exactly as they are trained to face medical or surgical emergencies in a systematic way. In Lebanon, 18.4% of hospital managers and directors suggested that PS integration into medical curricula would be important for patients, and 93% of medical students considered them important and called for their integration into curricula ⁷². This academic approach to PS education is also proposed in the WHO action plan for PS ⁸⁰.

6.9.Research on the Practice and Progress of PSC

PSC is still not a major priority in health management and policies in the MENA region, as indicated by the extremely small number of papers published on this issue in Lebanon and neighboring Arab countries. Funding for research on PS should be prioritized by the usual funders in the private and public sectors, focusing on the development and evaluation of interventions to improve PS outcomes and explore the

long-term impact of PS interventions on healthcare quality, patient outcomes, and healthcare costs. This aligns with the recommendations of the Jeddah Declaration released at the 4th Global Ministerial Summit on PS organized by the Saudi PS Center and WHO in 2019. The importance of investing in research to develop evidence-based solutions for improving PS, especially in low- and middle-income countries, was clearly emphasized in that Declaration ⁸¹.

In conclusion, PS challenges in public hospitals, and also but may be in lesser amounts in private hospitals in Lebanon require the participation of several stakeholders. It is an advantage that Lebanon is a small country where cooperation is easy and expected. Policymakers and hospital leaders should prioritize investments in PS infrastructure, training, and support systems across both the public and private sectors. This may include establishing dedicated PS units, providing ongoing training and education for healthcare professionals, and fostering a culture of transparency and shared responsibility for PS. By learning from each other's successes and challenges, hospitals can identify best practices and develop innovative solutions to improve PS outcomes. The quality of hospital care in a country, with an increasingly aging and fragile population ⁸², would thus improve at the most adequate moment.

APPENDIX A

TABLES

Table 1 Demographic and professional characteristics of physicians in public hospitals in Lebanon in 2020 (N= 111)

Variables	n	%
Gender		
Men	74	66.7
Women	37	33.3
Mean age in years (SD) (Range)	34.3 (9.4) (24-51)	
Marital status		
Single	61	55.0
Married	50	45.0
Position*		
Resident	42	37.8
Attending	69	62.2
Hospital of current practice		
University	54	48.6
General	57	51.4
Hospital location		
Urban/suburban	42	37.8
Rural	69	62.2
Accreditation level from Ministry of Public Health (A-D)		
A & B	37	33.3
C & D	74	66.7
Work schedule		
Day only	19	17.1
Alternating	92	82.9
Number of daily work hours**		
12 hours	69	62.2
> 12 hours	42	37.8
Number of weekly work hours**		
Up to 40	9	8.1
More than 40	102	91.9
Mean number of patients		
during day shift (SD) (Range)	18.97 (10.8) (6-44)	
during night shift (SD) (Range)	22.8 (15.2) (2-44)	
Exposed to “Patient Safety” in medical curriculum		
Yes	39	35.1
No/ Don’t Know	72	64.9

*Mean years of experience for resident = 3 (SD = 1.5) and for attending = 11.5 (SD = 7)

**Mean number of daily work hours was 15.1 (SD = 7.6) (Range = 8-34) and of weekly work hours 56.3 (12.7) (Range = 35-72)

Table 2a Organizational factors regarding patient safety (PS) as reported by physicians in public hospitals in Lebanon in 2020 (N= 111)

Variables	n	%
Office for PS and risk management		
Yes	31	27.9
No/Don't know	80	72.1
Integrated PS program		
Yes	35	31.5
No/Don't know	76	68.5
Standardized staff survey to assess hospital's PS culture		
Yes	17	15.3
No/Don't know	94	84.7
Periodic audit of the implementation of PS policies and procedures *		
Yes	9	8.1
No/Don't know	102	91.9
Periodic training program on PS?		
Yes	16	14.4
No/Don't know	95	85.6
New employees' orientation program includes PS policies and procedures *		
Yes	4	3.6
No/Don't know	107	96.4

* Not remaining in the rest of the analysis for lack of variability

Table 2b Physicians who reported the presence of audit and orientation in the public hospitals where they practice in 2020

Periodic audit of the implementation of PS policies and procedures (n=9)	
Hospitals	
Rural (Nabatieh and Marjayoun)	3/17
Urban (RH Beirut and Tripoli)	6/22
New employees' orientation program includes PS policies and procedures (n=4)	
Hospitals	
Rural (Nabatieh)	3/4
Suburban (Baabda)	1/34

Of the nine physicians reporting audits of PS implementation, 3 came from two rural hospitals: Nabatieh and Marjayoun. The other 6 came from the two largest urban public hospitals that were also represented: RH Beirut and Tripoli.

Table 3 Patient Safety (PS) knowledge and culture among physicians in public hospitals in Lebanon in 2020 (N= 111)

PS knowledge items*	Mean (SD)
Patient identification	80.5 (25.5)
Effective communication	55.5 (25.9)
Safety of high-alert medications	49.0 (34.0)
Surgical site Identification	58.8 (23.7)
Infection prevention and control	53.8 (25.8)
Patient risk for falling	50.0 (20.0)
Overall knowledge	60.0 (19.9)
PS culture items*	
Teamwork	63.3 (10.7)
Staffing and work pace	60.5 (8.0)
Organizational learning/ improvement	64.0 (14.0)
Response to error	59.5 (13.5)
Supervisor support for PS	60.0 (10.0)
Communication about error	60.0 (18.0)
Communication openness	59.5 (14.5)
Reporting PS events	44.0 (17.0)
Hospital management support for PS	66.0 (17.3)
Handoffs information exchange	65.3 (16.7)
Overall score	60.6 (6.5)
PS compliance items*	
Patient identification	68.0 (15.0)
Effective communication	58.7 (12.0)
Safety of high-alert medications	54.7 (15.3)
Surgical site identification	71.3 (14.7)
Infection prevention and control	46.0 (12.0)
Patient risk for falling	48.0 (20)
Overall score	58.8 (10.7)

* Each item includes several specific associated questions. Ranges have been standardized to a minimum of 0 and a maximum of 100

Table 4 Compliance with the International Patients Safety Goals (IPSG) by personal characteristics as reported by physicians in public hospitals in Lebanon (2020) (N= 111)

VARIABLES	Mean (SD)	Correlation	p-value
Personal Characteristics			
GENDER			0.232
Men	52.1 (10.9)	--	
Women	54.4 (6.1)		
Age in years	--	0.13	0.183
Marital status		--	0.398
Single	53.6 (7.6)		
Married	52.0 (11.5)		
Position		--	0.003
Resident	49.5 (9.5)		
Attending	54.9 (9.1)		
Years of experience	--	0.00	0.10
Exposed to “Patient Safety” in curriculum		--	.002
Yes	56.6 (4.7)		
No/ Don’t Know	50.9 (10.9)		
Hospital of current practice		--	0.08
University	54.6 (6.9)		
General	51.3 (11.4)		
Hospital location		--	<.001
Urban/suburban	59 (6.6)		
Rural	49.2 (9.2)		
Accreditation level from Ministry of Public Health (A-D)		--	0.84
A & B	49.3 (8.9)		
C & D	54.9 (9.4)		
Work schedule		--	<.001
Day only	46.4 (16.9)		
Alternating	54.2 (6.6)		
Number of daily work hours		--	<.001
12 hours	49.7 (9.7)		
> 12 hours	58.1 (6.6)		
Number of weekly work hours		--	0.04
Up to 40	57.6 (6)		
More than 40	52.5 (9.7)		
Number of patients			
during day shift		- 0.03	0.76
during night shift		0.12	0.21

Table 5 Compliance with the International Patients Safety Goals (IPSG) by organizational characteristics as reported by physicians in public hospitals in Lebanon (2020), (N= 111)

VARIABLES	Mean (SD)	p-value
Organizational Characteristics		
Office for PS and risk management		0.059
Yes	55.7 (12.1)	
No/Don't know	51.8 (8.2)	
Hospital established an integrated PS program		0.11
Yes	55.1 (7.8)	
No/Don't know	51.9 (10.2)	
Standardized survey of its staff to assess its PS culture		0.56
Yes		
No/Don't know	51.7 (14.7) 53.1 (8.4)	
Periodic training program on PS		<.001
Yes	60.3 (8.2)	
No/Don't know	51.7 (9.3)	

Table 6 Compliance with the International Patients Safety Goals (IPSG) by knowledge and cultural characteristics as reported by physicians in public hospitals in Lebanon (2020) (N= 111)

IPSG Knowledge	Correlation	p-value
Patient identification	0.3244	<.001
Effective communication	0.4463	<.001
Safety of high-alert medications	0.3951	<.001
Surgical site Identification	0.4967	<.001
Infection prevention and control	0.4057	<.001
Patient risk for falling	0.6268	<.001
Overall knowledge	0.5449	<.001
Overall score	0.55	<.001
PS Culture		
Teamwork	-0.10	0.28
Staffing and work pace	-0.05	0.63
Organizational learning/ improvement	0.14	0.14
Response to error	-0.12	0.21
Supervisor support for PS	0.05	0.58
Communication about error	-0.09	0.32
Communication openness	0.03	0.79
Reporting PS events	-0.19	0.04
Hospital management support for PS	0.00	0.10
Handoffs information exchange	-0.03	0.76
Overall score	-0.07	0.44

IPSG = international patient safety goals

Table 7 Compliance with the International Patients Safety Goals (IPSG) by personal characteristics of physicians, and PS knowledge and culture in public hospitals in Lebanon where they practiced in 2020: Multivariate linear regression model (N= 111)

Variable	Coefficient	P-value
Position (residents vs. attending physicians)	3.7	0.04
Exposed to PS in the medical curriculum (yes/no)	2.4	0.1
Hospital location (urban/suburban vs. rural)	6.9	0.00
Work schedule (Alternating vs. daytime only)	7.5	0.001
Daily work hours (12 hours vs. more)	-4.2	0.05
Weekly work hours (40 hours vs. more)	1.3	0.6
Office for PS and risk management	5.9	0.001
Periodic training program on PS	2.8	0.17
PS Knowledge Score	0.11	0.01
Reporting Patient Safety Events (0-10)	-1.04	0.02

Best Model

Variable	Coefficient	P-value
Hospital location (urban/suburban vs. rural)	8.0	< 0.001
Work schedule (daytime only vs. Alternating)	-9.3	< 0.001
Office for PS and risk management	6.2	< 0.001
PS Knowledge Score	0.15	< 0.001
Reporting Patient Safety Events (0-10)	-0.8	< 0.001

Adjusted R squared = 52.5

Table 8 Medical errors ever witnessed but not reported by physicians in public hospitals in Lebanon, in 2020, (N=111)

Variables	Total observed	Reported	Did not report
n (%)	111	38 (34.23%)	73 (65.77%)
Inappropriate medical diagnosis	80	24 (30.00%)	56 (70.00%)
Error in laboratory test results	82	28 (34.15%)	54 (65.85%)
Error in radiology test results	57	28 (49.12%)	29 (50.88%)
Error in effective communication	62	28 (45.16%)	34 (54.84%)
Error in medication dispensing, preparation, and administration	56	25 (44.64%)	31 (55.36%)
Error during patient surgery	78	27 (34.62%)	51 (65.38%)
A patient infected by nosocomial infection	85	27 (31.76%)	58 (68.24%)
Patient fall	84	29 (34.52%)	55 (65.48%)
Error in patient identification	41	21 (51.22%)	20 (48.78%)

APPENDIX B

Section I: Basic information		
1.	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female
2.	Age	
3.	Marital Status	<input type="checkbox"/> Single (skip to #5) <input type="checkbox"/> Married <input type="checkbox"/> Widowed <input type="checkbox"/> Divorced
4.	Number of Children	<input type="checkbox"/> Less than 3 <input type="checkbox"/> 3-5 <input type="checkbox"/> More than 5 <input type="checkbox"/> There is no
5.	Your position	<input type="checkbox"/> Resident doctor <input type="checkbox"/> Visiting doctor <input type="checkbox"/> Trained doctor <input type="checkbox"/> Registered nurse <input type="checkbox"/> Nurse assistant <input type="checkbox"/> Trained nurse <input type="checkbox"/> Nurse Manager <input type="checkbox"/> Pharmacist <input type="checkbox"/> Clinical pharmacist <input type="checkbox"/> Pharmacist assistant <input type="checkbox"/> Radiology technician <input type="checkbox"/> Laboratory technician <input type="checkbox"/> Supervisor
6.	Work experience in the profession	
7.	Educational Certificate	<input type="checkbox"/> University (<input type="checkbox"/> Master's <input type="checkbox"/> BS) <input type="checkbox"/> Public <input type="checkbox"/> Private <input type="checkbox"/> Professional (<input type="checkbox"/> BT <input type="checkbox"/> TS <input type="checkbox"/> LT) <input type="checkbox"/> Public <input type="checkbox"/> Private
8.	Did the educational curriculum that you studied include a course on patient safety management?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't know
9.	Hospital Type	<input type="checkbox"/> University <input type="checkbox"/> General
10.	Hospital Location (where you work)	<input type="checkbox"/> City (Specify) _____ <input type="checkbox"/> Rural (Specify) _____
11.	Accreditation level	<input type="checkbox"/> A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> I don't know

12.	Department	<input type="checkbox"/> Medicine room <input type="checkbox"/> ICU <input type="checkbox"/> Pediatrics <input type="checkbox"/> Anesthesiology <input type="checkbox"/> Surgery <input type="checkbox"/> NICU <input type="checkbox"/> Pharmacy <input type="checkbox"/> Other (specify) _____ <input type="checkbox"/> Obstetrics <input type="checkbox"/> Operating room <input type="checkbox"/> Emergency department <input type="checkbox"/> Laboratory <input type="checkbox"/> Radiology
13.	The number of hours of your daily work	<input type="checkbox"/> 8 hours <input type="checkbox"/> 12 hours <input type="checkbox"/> 16 hours <input type="checkbox"/> 24 hours Other (specify): _____
14.	Your work schedule	<input type="checkbox"/> Day shift <input type="checkbox"/> Night shift <input type="checkbox"/> Alternating
15.	Your weekly work hours (including overtime hours)	<input type="checkbox"/> Less than 36 hours <input type="checkbox"/> 50-56 hours <input type="checkbox"/> 36-42 hours <input type="checkbox"/> 57-63 hours <input type="checkbox"/> 43-49 hours <input type="checkbox"/> More than 63 hours
16.	How many patients do you care for during your day shift?	
17.	How many patients do you care for during your night shift?	
18.	Is there an office for patient safety and risk management?	
	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't Know	

19.	Is there a patient safety and risk management officer? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't Know							
20.	Has this hospital established an integrated patient safety program? <input type="checkbox"/> Yes, implemented and monitored periodically <input type="checkbox"/> Yes, in progress <input type="checkbox"/> No <input type="checkbox"/> I don't Know							
21.	Has this hospital conducted a standardized survey of its staff to assess its patient safety culture <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't Know							
22.	Is there a periodic audit of the implementation of patient safety policies and procedures? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't Know							
23.	Is there a periodic training program on patient safety? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't Know							
24.	Does the new employees' orientation program include patient safety policies and procedures? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> I don't Know							
Section II: Patient Safety Culture								
Using the scale below, please indicate your level of agreement by putting a cross X where appropriate								
Strongly disagree (1)	Disagree (2)	Don't know (3)	Agree (4)	Strongly agree (5)				
Teamwork				1	2	3	4	5
25.	In this unit, we work together as an effective team.							
26.	During busy times, staff in this unit help each other							
27.	There is a problem with disrespectful behavior by those working in this unit.							
Staffing and Work Pace								
28.	In this unit, we have enough staff to handle the workload.							
29.	Staff in this unit work longer hours than is best for patient care							
30.	This unit relies too much on temporary, float, or PRN staff							
31.	The work pace in this unit is so rushed that it negatively affects patient safety							
Organizational Learning—Continuous Improvement								
32.	This unit regularly reviews work processes to determine if changes are needed to improve patient safety							
33.	In this unit, changes to improve patient safety are evaluated to see how well they							

	worked					
34.	This unit lets the same patient safety problems keep happening					
Response to Error						
35.	In this unit, staff feel like their mistakes are held against them					

Strongly disagree (1)	Disagree (2)	Don't know (3)	Agree (4)	Strongly agree (5)	1	2	3	4	5
36.	When an event is reported in this unit, it feels like the person is being written up, not the problem								
37.	When staff make errors, this unit focuses on learning rather than blaming individuals								
38.	In this unit, there is a lack of support for staff involved in patient safety errors								
Your supervisor's/manager's support for patient safety									
39.	My supervisor, manager, or clinical leader seriously considers staff suggestions for improving patient safety								
40.	My supervisor, manager, or clinical leader wants us to work faster during busy times, even if it means taking shortcuts								
41.	My supervisor, manager, or clinical leader takes action to address patient safety concerns that are brought to their attention								
Communication About Error									
Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	1	2	3	4	5
42.	We are informed about errors that happen in this unit								
43.	When errors happen in this unit, we discuss ways to prevent them from happening again								
44.	In this unit, we are informed about changes that are made based on event reports								
Communication Openness									
45.	In this unit, staff speak up if they see something that may negatively affect patient care								
46.	When staff in this unit see someone with more authority doing something unsafe for patients, they speak up								
47.	When staff in this unit speak up, those with more authority are open to their patient								

	safety concerns								
48.	In this unit, staff are afraid to ask questions when something does not seem right								
Reporting Patient Safety Events									
Frequency of event Reported (Please put a cross X where appropriate)		Never	Rarely	Sometimes	Often	Always			
49.	When a mistake is caught and corrected before reaching the patient, how often is this reported?								
50.	When a mistake reaches the patient and could have harmed the patient, but did not, how often is this reported?								
Hospital Management Support for Patient Safety									
Using the scale below, please indicate your level of agreement by putting a cross X where appropriate									
Strongly disagree (1)	Disagree (2)	Don't know (3)	Agree (4)	Strongly agree (5)	2	3	4	5	
51.	The actions of hospital management show that patient safety is a top priority								
52.	Hospital management provides adequate resources to improve patient safety								
53.	Hospital management seems interested in patient safety only after an adverse event happens								
Handoffs and Information Exchange									
54.	When transferring patients from one unit to another, important information is often left out.								
55.	During shift changes, important patient care information is often left out								
56.	During shift changes, there is adequate time to exchange all key patient care information								

Section III: International Patient Safety goals
Please read carefully the following questions and mark the appropriate box?
Patient Identification

63.	<p>What information is documented on the bracelet of unknown patients?</p> <p><input type="checkbox"/> I don't put a bracelet for the patient until his identity is verified.</p> <p><input type="checkbox"/> Anonymous</p> <p><input type="checkbox"/> "Anonymous" attached with a serial number such as Anonymous 1 with gender identification, room number, medical record number, and his attending physician's name</p> <p><input type="checkbox"/> Anonymous, attending physician's name, and room number.</p>
64.	<p>When is putting a patient identification bracelet?</p> <p><input type="checkbox"/> Before patient care admission <input type="checkbox"/> Upon patient's admission</p> <p><input type="checkbox"/> Within 6 hours of patient's admission <input type="checkbox"/> Within 12 hours of patient's admission</p>

65.	<p>What do you do when you see a patient without his patient identification bracelet?</p> <p><input type="checkbox"/> Put a bracelet.</p> <p><input type="checkbox"/> Put the bracelet, inform my supervisor and fill up the incident accident report form.</p> <p><input type="checkbox"/> Inform the nurse in charge. <input type="checkbox"/> Nothing</p>
66.	<p>What do you do when you find an error in the information on the patient identification bracelet?</p> <p><input type="checkbox"/> Change the bracelet.</p> <p><input type="checkbox"/> Change the bracelet, inform the supervisor and fill up the incident and accident report error form.</p> <p><input type="checkbox"/> Inform the nurse in charge.</p> <p><input type="checkbox"/> Nothing</p>
67.	<p>When is the identification bracelet removed from the patient's wrist?</p> <p><input type="checkbox"/> Upon the patient's request <input type="checkbox"/> Upon the completion of laboratory and radiological examinations</p> <p><input type="checkbox"/> Upon the patient's discharge <input type="checkbox"/> When his health conditions improve</p>
Effective Communication	
68.	<p>Who receives the medical verbal order?</p> <p><input type="checkbox"/> Nursing director <input type="checkbox"/> Nurse manager <input type="checkbox"/> Registered nurse <input type="checkbox"/> Nurse assistant</p> <p><input type="checkbox"/> Resident</p> <p><input type="checkbox"/> Don't know <input type="checkbox"/> Other (please specify)_____</p>
69.	<p>How is the medical verbal order received?</p> <p><input type="checkbox"/> It is documented in the medical order form.</p> <p><input type="checkbox"/> It is fully documented in the medical order form, read by the recipient and confirmed by the physician who gives the order.</p> <p><input type="checkbox"/> It is documented on a small paper in the patient's file, then written on the medical order form by the attending physician when he/she comes.</p> <p><input type="checkbox"/> It is fully documented in the medical file.</p> <p><input type="checkbox"/> I don't know</p>

70.	<p>How is the medical verbal order written/documented?</p> <p><input type="checkbox"/> Writing the medical verbal order, signing it, stating the date and hour and the employee's name and position.</p> <p><input type="checkbox"/> Writing the phrase “medical verbal order” and the phrase “read for the second time” alongside the medical order with the date, the hour and the employee’s name and position.</p> <p><input type="checkbox"/> Writing the medical order, the attending physician's name and his/her stamp.</p> <p><input type="checkbox"/> Other, specify:</p> <p>_____</p> <p><input type="checkbox"/> I don’t know</p>
71.	<p>When is the medical verbal order signed in the medical record?</p> <p><input type="checkbox"/> Upon the patient's discharge <input type="checkbox"/> When the attending physician comes to the hospital.</p> <p><input type="checkbox"/> Within 24 hours of his/her registration. <input type="checkbox"/> When the resident physician arrives</p> <p><input type="checkbox"/> I don’t know</p>
72.	<p>When is the medical verbal order used?</p> <p><input type="checkbox"/> Upon the patient’s request <input type="checkbox"/> During work overload <input type="checkbox"/> In case of emergency</p> <p><input type="checkbox"/> When the attending physician is busy <input type="checkbox"/> I don’t know</p>
73.	<p>Who is the person contacted when there is a critical patient’s result?</p> <p><input type="checkbox"/> Department head where the patient is <input type="checkbox"/> Nursing supervisor <input type="checkbox"/> Attending physician</p> <p><input type="checkbox"/> Patient safety office <input type="checkbox"/> Other, specify:</p> <p>_____</p> <p><input type="checkbox"/> I don’t know</p>
74.	<p>Who is contacted when the attending physician cannot be reached?</p> <p><input type="checkbox"/> Nursing director <input type="checkbox"/> The department head or registered nurse who’s responsible for the patient</p> <p><input type="checkbox"/> Resident physician <input type="checkbox"/> Patient safety office <input type="checkbox"/> Other, specify:</p> <p><input type="checkbox"/> I don’t know</p>
75.	<p>The information is documented when the critical results are reported on:</p> <p><input type="checkbox"/> Laboratory/ Radiology Departments registers <input type="checkbox"/> Department register where the patient</p> <p><input type="checkbox"/> Patient Safety Office Register <input type="checkbox"/> Release the results as usual</p> <p><input type="checkbox"/> I don’t know</p>
76.	<p>The critical results are reported (within):</p> <p><input type="checkbox"/> 24 hours <input type="checkbox"/> 2 hours <input type="checkbox"/> immediately <input type="checkbox"/> 12 hours</p> <p><input type="checkbox"/> I don't know</p>
Transmission	

77.	Is there a handoff communication tool used by healthcare providers during patient transitions? <input type="checkbox"/> Yes to 79) <input type="checkbox"/> No (Skip to 79) <input type="checkbox"/> I don't know (Skip to 79)
78.	When is this approved method used for the patient transition? <input type="checkbox"/> Change of work shift between healthcare providers working in all departments. <input type="checkbox"/> Reporting of patient's medical information among the departments. <input type="checkbox"/> In case of emergency <input type="checkbox"/> All of the above. <input type="checkbox"/> I don't know
Dangerous medications and look-alike sound-alike medications	
79.	Where are the dangerous medications stored? <input type="checkbox"/> In lockers with double keys <input type="checkbox"/> In lockers with one key <input type="checkbox"/> In medications trolleys <input type="checkbox"/> I don't know <input type="checkbox"/> Other (Specify): _____
80.	The dangerous medications are administered and signed on the medical record by: <input type="checkbox"/> Registered nurse <input type="checkbox"/> Two registered nurses <input type="checkbox"/> Registered nurse and assistant nurse <input type="checkbox"/> Two assistant nurses <input type="checkbox"/> I don't know
Medications Reconciliation	
81.	Who collects the information about the patient's medications? <input type="checkbox"/> Pharmacist <input type="checkbox"/> Attending physician <input type="checkbox"/> Registered nurse <input type="checkbox"/> All of them <input type="checkbox"/> I don't know
82.	When is the information about the patient's medication collected? <input type="checkbox"/> During the 6 hours of patient's admission <input type="checkbox"/> Upon patient's discharge <input type="checkbox"/> During patient's transfer <input type="checkbox"/> All of them <input type="checkbox"/> I don't know
83.	Who gives the medication education to patients? <input type="checkbox"/> Pharmacist <input type="checkbox"/> Registered nurse <input type="checkbox"/> Attending physician <input type="checkbox"/> Dietician <input type="checkbox"/> All of them <input type="checkbox"/> I don't know
Skip to 88	
For nurses and physicians only (please put a cross X in the appropriate box)	
Surgical Site Identification	
84.	Who's responsible for surgical site identification? <input type="checkbox"/> Registered nurse <input type="checkbox"/> Radiology technician <input type="checkbox"/> Operating room nurse <input type="checkbox"/> Surgeon <input type="checkbox"/> Other (specify): _____ <input type="checkbox"/> I don't know

85.	<p>How is the surgical site identified?</p> <p><input type="checkbox"/> Marking the surgical site <input type="checkbox"/> Recording the patient's identification and the type of surgery</p> <p><input type="checkbox"/> Documenting the type of surgery on the patient's request form</p> <p><input type="checkbox"/> Documenting the type of surgery on the medical record form</p> <p><input type="checkbox"/> I don't know</p>
86.	<p>When is the safe surgery checklist filled up?</p> <p><input type="checkbox"/> Before anesthesia, before incision, before patient leave the operating room</p> <p><input type="checkbox"/> Before anesthesia</p> <p><input type="checkbox"/> Before patient leave the operating room</p> <p><input type="checkbox"/> Before patient leave the recovery room</p> <p><input type="checkbox"/> I don't know</p>
87.	<p>When is the time out applied?</p> <p><input type="checkbox"/> Immediately after patient anesthesia</p> <p><input type="checkbox"/> Immediately after patient's skin preparation to surgery</p> <p><input type="checkbox"/> Before patient anesthesia</p> <p><input type="checkbox"/> When the surgeon demand</p> <p><input type="checkbox"/> I don't know</p>
Infection prevention and control	
88.	<p>When do you wash your hands in hospital?</p> <p><input type="checkbox"/> After every patient care <input type="checkbox"/> Before every patient care <input type="checkbox"/> When they are dirty</p> <p><input type="checkbox"/> Before touching the patient, care that requires disinfection, after risk of contact with patient's fluid, after touching the patient, after touching the patient's environment</p> <p><input type="checkbox"/> I don't know</p>
89.	<p>How long is the simple hand washing?</p> <p><input type="checkbox"/> 15-30 seconds <input type="checkbox"/> 40-60 seconds <input type="checkbox"/> 60-90 seconds <input type="checkbox"/> 90-120 seconds</p> <p><input type="checkbox"/> I don't know</p>
90.	<p>How long is the hand rub with disinfection products?</p> <p><input type="checkbox"/> 15-30 seconds <input type="checkbox"/> 40-60 seconds <input type="checkbox"/> 60-90 seconds <input type="checkbox"/> 90-120 seconds</p> <p><input type="checkbox"/> I don't know</p>
91.	<p>What does personal protective equipment consist of?</p> <p><input type="checkbox"/> Gloves, mask, face shield, goggles, apron gown, shoes cover</p> <p><input type="checkbox"/> Gloves, mask, face shield, goggles, apron gown</p> <p><input type="checkbox"/> Gloves, mask, face shield, goggles, apron gown, head cover</p> <p><input type="checkbox"/> Gloves, mask, face shield, goggles, apron gown, head and shoes covers</p> <p><input type="checkbox"/> I don't know</p>

100	When is the patient assessed to determine the patient fall scale? <input type="checkbox"/> Upon admission Within 12 hours <input type="checkbox"/> Within 24 hours <input type="checkbox"/> Within 6 hours of patient admission and according to the scale result <input type="checkbox"/> I don't know									
101	Is there a mark for the patients who are at risk for falls? <input type="checkbox"/> Yes (<input type="checkbox"/> Red bracelet medical record) <input type="checkbox"/> Mark on the patient's bed <input type="checkbox"/> Mark on the <input type="checkbox"/> No <input type="checkbox"/> I don't know									
102	What are the procedures followed to reduce patient falls? <input type="checkbox"/> Patient and family education on patient falls prevention, elevating the side rails, helping the patient to wear special stocking to prevent falls. <input type="checkbox"/> Asking family to be on the patient's side. <input type="checkbox"/> Providing a private nurse for the patient. <input type="checkbox"/> Patient restraint <input type="checkbox"/> I don't know									
Compliance with International Patient Safety Goals										
Please state your compliance to the following by putting an X into the appropriate place										
	Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	1	2	3	4	5
103	The patient is identified using two identifiers other than the patient room number and bed number									
104	Match the patient's identity before any medical procedure									
105	Know the patient's medical samples directly									
106	Patients are educated about the importance of their identification before each care.									
107	Write, read back, and confirm oral or telephone medical orders before they are carried out									
108	The working medical staff adheres to the medical abbreviations circulated in the hospital.									
109	A handoff communication tool is used during the reception and delivery of patients									
110	Dangerous medicines are prepared by licensed nurses									

111	Keep dangerous medicines in locked cabinets					
-----	---	--	--	--	--	--

Never (1)	Rarely (2)	Sometimes (3)	Often (4)	Always (5)	1	2	3	4	5
112.	The patient is provided with the necessary instructions about the drug (indications for use, side effects) before giving it								
113.	The correct surgical site is ascertained before the patient is sent for surgery and before any surgical intervention is started as documented.								
114.	The safety checklist is approved in surgical procedures (especially doctors and nurses)								
115.	This form is to be filled out with every surgical procedure (especially doctors and nurses).								
116.	Adhere to hand washing procedures								
117.	Adhere to protective clothing when providing patient care								
118.	The form is to be filled out prior to the cares included in infection control bundles (for doctors and nurses only)								
119.	Completed daily monitoring form for care included in infection control bundles (for doctors and nurses only)								
120.	Assess the risk of falling on admission and thereafter according to the outcome								

Section IV: Patient Safety Grade			
Number of Events Reported			
121.	In the past 12 months, how many patient safety events have you reported? <input type="checkbox"/> None <input type="checkbox"/> 1-2 <input type="checkbox"/> 3-4 <input type="checkbox"/> 5-10 <input type="checkbox"/> more than 10		
122.	What kind of medical errors did you encounter during the past year that were not reported?? Please put a cross X where appropriate.		
	Yes	No	I don't know
Inappropriate medical diagnosis			
Error in laboratory test results			
Error in radiology test results			
Error in effective communication			
Error in medications dispensing, preparation, and administration			
Error in patient surgery			
A patient infected by nosocomial infection			
Patient fall			
Error in patient identification			

Patient Safety Rating			
123.	Please give your work area / unit in this hospital an overall grade on patient safety. <input type="checkbox"/> Excellent <input type="checkbox"/> Very Good <input type="checkbox"/> Acceptable <input type="checkbox"/> Poor <input type="checkbox"/> Failing		
124.	Please give the hospital an overall grade on patient safety. <input type="checkbox"/> Excellent <input type="checkbox"/> Very Good <input type="checkbox"/> Acceptable	<input type="checkbox"/> Poor	<input type="checkbox"/> Failing

REFERENCES

1. WHO. Patient Safety. WHO. Accessed 11 September 2023, 2023. [https://www.who.int/news-room/fact-sheets/detail/patient-safety#:~:text=Key%20facts,from%20unsafe%20care%20\(1\).](https://www.who.int/news-room/fact-sheets/detail/patient-safety#:~:text=Key%20facts,from%20unsafe%20care%20(1).)
2. Institute of Medicine Committee on Quality of Health Care in A. In: Kohn LT, Corrigan JM, Donaldson MS, eds. *To Err is Human: Building a Safer Health System*. National Academies Press (US) Copyright 2000 by the National Academy of Sciences. All rights reserved.; 2000.
3. Leape L, Berwick D, Clancy C, et al. Transforming healthcare: a safety imperative. *Qual Saf Health Care*. Dec 2009;18(6):424-8. doi:10.1136/qshc.2009.036954
4. Joint Commission I, Joint Commission on Accreditation of Healthcare O. *Joint Commission International accreditation standards for hospitals : including standards for Academic Medical Center Hospitals*. Seventh edition ed. Joint Commission Resources Oak Brook, Illinois; 2020. <https://www.clinicalkey.com/dura/browse/bookChapter/3-s2.0-B9781635851489X50013>
5. Sorra JS, Dyer N. Multilevel psychometric properties of the AHRQ hospital survey on patient safety culture. *BMC Health Serv Res*. Jul 8 2010;10:199. doi:10.1186/1472-6963-10-199
6. Reason J. Human error: models and management. *Bmj*. Mar 18 2000;320(7237):768-70. doi:10.1136/bmj.320.7237.768
7. Astier-Peña MP, Martínez-Bianchi V, Torijano-Casalengua ML, Ares-Blanco S, Bueno-Ortiz J-M, Fernández-García M. The Global Patient Safety Action Plan 2021-2030: Identifying actions for safer primary health care. *Atencion primaria*. 2021;53:102224-102224.
8. Sandlin D. The Joint Commission's Speak Up™ Initiative. *Journal of PeriAnesthesia Nursing*. 2007/12/01/ 2007;22(6):438-439. doi:<https://doi.org/10.1016/j.jopan.2007.09.001>
9. Haynes AB, Weiser TG, Berry WR, et al. A Surgical Safety Checklist to Reduce Morbidity and Mortality in a Global Population. *New England Journal of Medicine*. 2009;360(5):491-499. doi:10.1056/NEJMsa0810119
10. Vaida AJ, Lamis RL, Smetzer JL, Kenward K, Cohen MR. Assessing the State of Safe Medication Practices Using the ISMP Medication Safety Self Assessment® for

Hospitals: 2000 and 2011. *The Joint Commission Journal on Quality and Patient Safety*. 2014/02/01/ 2014;40(2):51-AP3. doi:[https://doi.org/10.1016/S1553-7250\(14\)40007-2](https://doi.org/10.1016/S1553-7250(14)40007-2)

11. Elmontsri M, Almashrafi A, Banarsee R, Majeed A. Status of patient safety culture in Arab countries: a systematic review. *BMJ Open*. Feb 24 2017;7(2):e013487. doi:10.1136/bmjopen-2016-013487
12. El-Jardali F, Sheikh F, Garcia NA, Jamal D, Abdo A. Patient safety culture in a large teaching hospital in Riyadh: baseline assessment, comparative analysis and opportunities for improvement. *BMC Health Services Research*. 2014/03/12 2014;14(1):122. doi:10.1186/1472-6963-14-122
13. Alswat K, Abdalla RAM, Titi MA, et al. Improving patient safety culture in Saudi Arabia (2012-2015): trending, improvement and benchmarking. *BMC Health Serv Res*. Aug 2 2017;17(1):516. doi:10.1186/s12913-017-2461-3
14. Alquwez N, Cruz JP, Almoghairi AM, et al. Nurses' Perceptions of Patient Safety Culture in Three Hospitals in Saudi Arabia. *J Nurs Scholarsh*. Jul 2018;50(4):422-431. doi:10.1111/jnu.12394
15. Alharbi W, Cleland J, Morrison Z. Assessment of Patient Safety Culture in an Adult Oncology Department in Saudi Arabia. *Oman Med J*. May 2018;33(3):200-208. doi:10.5001/omj.2.018.38
16. Alshammari F, Pasay-an E, Alboliteh M, et al. A survey of hospital healthcare professionals' perceptions toward patient safety culture in Saudi Arabia. *International Journal of Africa Nursing Sciences*. 2019/01/01/ 2019;11:100149. doi:<https://doi.org/10.1016/j.ijans.2019.100149>
17. Alenezi A, Pandaan RPM, Almazan JU, Pandaan IN, Casison FS, Cruz JP. Clinical practitioners' perception of the dimensions of patient safety culture in a government hospital: A one-sample correlational survey. *J Clin Nurs*. Dec 2019;28(23-24):4496-4503. doi:10.1111/jocn.15038
18. AlReshidi A, Farajat M, Ibrahim T, Alresheedi A, Elnefiely A, Alforaih F. Current status and predictors of patient safety culture in hospitals of Qassim region, Saudi Arabia. *Dr Sulaiman Al Habib Medical Journal*. 2020;2(2):76-82.
19. AlMaani MM, Salama KF. Assessment of Attitude of Primary Care Medical Staff Toward Patient Safety Culture in Primary Health-care Centers--Al-Ahsa, Saudi Arabia. *J Multidiscip Healthc*. 2021;14:2731-2740. doi:10.2147/jmdh.S323832
20. Aljaffary A, Awad Albaalharith M, Alumran A, Alrawiai S, Hariri B. Patient Safety Culture in Primary Healthcare Centers in the Eastern Province of Saudi Arabia. *Risk Manag Healthc Policy*. 2022;15:229-241. doi:10.2147/rmhp.S336117

21. Rawas H, Abou Hashish EA. Predictors and outcomes of patient safety culture at King Abdulaziz Medical City, Jeddah, Saudi Arabia. A nursing perspective. *BMC Nurs.* Jul 3 2023;22(1):229. doi:10.1186/s12912-023-01391-w
22. Binkheder S, Alaska YA, Albaharnah A, et al. The relationships between patient safety culture and sentinel events among hospitals in Saudi Arabia: a national descriptive study. *BMC Health Serv Res.* Mar 18 2023;23(1):270. doi:10.1186/s12913-023-09205-0
23. Albaalharith T, A'Aqoulah A. Level of Patient Safety Culture Awareness Among Healthcare Workers. *J Multidiscip Healthc.* 2023;16:321-332. doi:10.2147/jmdh.S376623
24. Ahmed N, Adam S, Al-Moniem I. Patient Safety: Assessing Nurses' Perception and Developing an Improvement Plan. *Life Science Journal.* 01/01 2011;8:53-64.
25. Aboul-Fotouh AM, Ismail NA, Ez Elarab HS, Wassif GO. Assessment of patient safety culture among healthcare providers at a teaching hospital in Cairo, Egypt. *East Mediterr Health J.* Apr 2012;18(4):372-7. doi:10.26719/2012.18.4.372
26. Abdelhai R, Abdelaziz SB, Ghanem NS. Assessing Patient Safety Culture and Factors Affecting It among Health Care Providers at Cairo University Hospitals. 2012:
27. Mohamed A, Ali M, Gewaifel G. Assessment of Patient Safety Culture in Primary Healthcare Services in Alexandria, Egypt. *Global Journal of Epidemiology and Public Health.* 03/11 2016;2:5-14. doi:10.12974/2313-0946.2015.02.01.1
28. El-Shabrawy EM, Anwar MM, Mostafa ZM. Assessment of Patient Safety Culture among Health Care Workers in Beni-Suef University Hospital , Egypt. 2017:
29. Abdo S, Atallah A, El-saleet G, El-kafas E. Assessment of unit level patient safety culture dimensions in Tanta University Hospitals, Egypt. *Int J Curr Microbiol Appl Sci.* 2018;7(10):861-72.
30. El Shafei AMH, Zayed MA. Patient safety attitude in primary health care settings in Giza, Egypt: Cross-sectional study. *The International journal of health planning and management.* 2019;34(2):851-861.
31. Salem M, Labib J, Mahmoud A, Shalaby S. Nurses' perceptions of patient safety culture in intensive care units: a cross-sectional study. *Open access Macedonian journal of medical sciences.* 2019;7(21):3667.
32. El-Sherbiny NA, Ibrahim EH, Abdel-Wahed WY. Assessment of patient safety culture among paramedical personnel at general and district hospitals, Fayoum Governorate, Egypt. *Journal of the Egyptian Public Health Association.* 2020;95:1-8.
33. Foda ESI, Ibrahim AG, Ali AMM, El-Menshawry AM, Elweshahi HMT. Assessment of patient safety culture perception among healthcare workers in intensive care

units of Alexandria main university Hospital, Egypt. *Alexandria Journal of Medicine*. 2020;56(1):173-180.

34. Ali Ali HM, Abdul-Aziz AM, Darwish EAF, Swelem MS, Sultan EA. Assessment of patient safety culture among the staff of the University Hospital for Gynecology and Obstetrics in Alexandria, Egypt. *Journal of the Egyptian Public Health Association*. 2022;97(1):20.

35. Abdelaliem SMF, Alsenany SA. Factors Affecting Patient Safety Culture from Nurses' Perspectives for Sustainable Nursing Practice. MDPI; 2022:1889.

36. Hussein YH, Eldeeb SM, Elshamy RA, Eldin RM. Patient safety attitude among healthcare workers at different levels of healthcare in Sharqia Governorate, Egypt. *African Journal of Primary Health Care & Family Medicine*. 2022;14(1):3307.

37. AbuAlRub RF, Abu Alhijaa EH. The impact of educational interventions on enhancing perceptions of patient safety culture among Jordanian senior nurses. Wiley Online Library; 2014:139-150.

38. Khater W, Akhu-Zaheya L, Al-Mahasneh S, Khater R. Nurses' perceptions of patient safety culture in Jordanian hospitals. *International Nursing Review*. 2015;62(1):82-91.

39. Saleh AM, Darawad MW, Al-Hussami M. The perception of hospital safety culture and selected outcomes among nurses: An exploratory study. *Nursing & health sciences*. 2015;17(3):339-346.

40. Al-Nawafleh A, Abu-Helalah MA, Hill V, Masoud MI, Al-Mahasneh HA, Al Salti ET. Patient safety culture in Jordanian hospitals. *Health Science Journal*. 2016;10(5):1.

41. Suliman M, Aljezawi M, AlBashtawy M, Fitzpatrick J, Aloush S, Al-Awamreh K. Exploring safety culture in Jordanian hospitals. *Journal of nursing care quality*. 2017;32(3):E1-E7.

42. Khamaiseh A, Al-Twalbeh D, Al-Ajlouni K. Patient safety culture in Jordanian primary health-care centres as perceived by nurses: a cross-sectional study. *East Mediterr Health J*. Oct 13 2020;26(10):1242-1250. doi:10.26719/emhj.20.044

43. Amarnah BH, Al Nobani F. The influence of physician-nurse collaboration on patient safety culture. *Heliyon*. Sep 2022;8(9):e10649. doi:10.1016/j.heliyon.2022.e10649

44. Malak MZ, Salouk J, Al-Shawawreh R, Al-Kamiseh H, Ayed A. Perceptions of patient safety culture among emergency room nurses in Jordanian accredited hospitals. *J Nurs Manag*. Oct 2022;30(7):3131-3138. doi:10.1111/jonm.13729

45. Stewart D, Thomas B, MacLure K, et al. Perspectives of healthcare professionals in Qatar on causes of medication errors: A mixed methods study of safety culture. *PLOS ONE*. 2018;13(9):e0204801. doi:10.1371/journal.pone.0204801
46. El Zoghbi M, Farooq S, Abulaban A, et al. Improvement of the Patient Safety Culture in the Primary Health Care Corporation - Qatar. *J Patient Saf*. Dec 1 2021;17(8):e1376-e1382. doi:10.1097/pts.0000000000000489
47. Abdulla MA, Habas E, Sr., Al Halabi A, et al. An Evaluation of Healthcare Safety Culture Among Healthcare Professionals in Secondary and Tertiary Public Hospitals in the Middle East Region. *Cureus*. Feb 2023;15(2):e35299. doi:10.7759/cureus.35299
48. Logroño KJ, Al-Lenjawi BA, Singh K, Alomari A. Assessment of nurse's perceived just culture: a cross-sectional study. *BMC Nursing*. 2023/10/03 2023;22(1):348. doi:10.1186/s12912-023-01478-4
49. Ammouri AA, Tailakh AK, Muliira JK, Geethakrishnan R, Al Kindi SN. Patient safety culture among nurses. *Int Nurs Rev*. Mar 2015;62(1):102-10. doi:10.1111/inr.12159
50. Al-Mandhari A, Al-Zakwani I, Al-Kindi M, Tawilah J, Dorvlo AS, Al-Adawi S. Patient safety culture assessment in oman. *Oman Med J*. Jul 2014;29(4):264-70. doi:10.5001/omj.2014.70
51. Al Lawati MH, Short SD, Abdulhadi NN, Panchatcharam SM, Dennis S. Assessment of patient safety culture in primary health care in Muscat, Oman: a questionnaire -based survey. *BMC Fam Pract*. Apr 5 2019;20(1):50. doi:10.1186/s12875-019-0937-4
52. Al Nadabi W, Faisal M, Mohammed MA. Patient safety culture in Oman: A national study. *J Eval Clin Pract*. Oct 2020;26(5):1406-1415. doi:10.1111/jep.13322
53. Ali H, Ibrahim SZ, Al Mudaf B, Al Fadalh T, Jamal D, El-Jardali F. Baseline assessment of patient safety culture in public hospitals in Kuwait. *BMC Health Serv Res*. Mar 6 2018;18(1):158. doi:10.1186/s12913-018-2960-x
54. Alqattan H, Cleland J, Morrison Z. An evaluation of patient safety culture in a secondary care setting in Kuwait. *J Taibah Univ Med Sci*. Jun 2018;13(3):272-280. doi:10.1016/j.jtumed.2018.02.002
55. Al Hamid A, Malik A, Alyatama S. An exploration of patient safety culture in Kuwait hospitals: a qualitative study of healthcare professionals' perspectives. *Int J Pharm Pract*. Dec 2020;28(6):617-625. doi:10.1111/ijpp.12574
56. Alfadhlah T, Al Mudaf B, Alghanim HA, et al. Baseline assessment of patient safety culture in primary care centres in Kuwait: a national cross-sectional study. *BMC Health Services Research*. 2021/10/28 2021;21(1):1172. doi:10.1186/s12913-021-07199-1

57. Ministry of Public Health L. Accreditation Standards for Hospitals in Lebanon. Ministry of Public Health, Lebanon. Accessed December, 2022. <https://www.moph.gov.lb/en/Pages/3/20553/-revised-hospital-accreditation-standards-in-lebanon-december-2022>
58. El-Jardali F, Jaafar M, Dimassi H, Jamal D, Hamdan R. The current state of patient safety culture in Lebanese hospitals: a study at baseline. *Int J Qual Health Care*. Oct 2010;22(5):386-95. doi:10.1093/intqhc/mzq047
59. El-Jardali F, Dimassi H, Jamal D, Jaafar M, Hemadeh N. Predictors and outcomes of patient safety culture in hospitals. *BMC Health Serv Res*. Feb 24 2011;11:45. doi:10.1186/1472-6963-11-45
60. Sorra J, Nieva VF, Westat I, United States Agency for Healthcare R, Quality. *Hospital survey on patient safety culture*. [Agency for Healthcare Research and Quality] [Rockville, MD]; 2004. <https://purl.fdlp.gov/GPO/LPS83504>
61. Sorra J YN, Famolaro T, et al. Quality AfHRA, ed. *AHRQ Hospital Survey on Patient Safety Culture Version 2.0: User's Guide*. Agency for Healthcare Research and Quality; 2021. <https://www.ahrq.gov/sites/default/files/wysiwyg/sops/surveys/hospital/hospitalsurvey2-users-guide.pdf>
62. Alahmadi HA. Assessment of patient safety culture in Saudi Arabian hospitals. *Qual Saf Health Care*. Oct 2010;19(5):e17. doi:10.1136/qshc.2009.033258
63. Matsubara S, Hagihara A, Nobutomo K. Development of a patient safety climate scale in Japan. *Int J Qual Health Care*. Jun 2008;20(3):211-20. doi:10.1093/intqhc/mzn003
64. Haugen AS, Sjøfteland E, Eide GE, Nortvedt MW, Aase K, Harthug S. Patient safety in surgical environments: cross-countries comparison of psychometric properties and results of the Norwegian version of the Hospital Survey on Patient Safety. *BMC Health Serv Res*. Sep 22 2010;10:279. doi:10.1186/1472-6963-10-279
65. Bodur S, Filiz E. Validity and reliability of Turkish version of "Hospital Survey on Patient Safety Culture" and perception of patient safety in public hospitals in Turkey. *BMC Health Serv Res*. Jan 28 2010;10:28. doi:10.1186/1472-6963-10-28
66. Smits M, Christiaans-Dingelhoff I, Wagner C, van der Wal G, Groenewegen PP. The psychometric properties of the 'Hospital Survey on Patient Safety Culture' in Dutch hospitals. *BMC health services research*. 2008;8(1):1-9.
67. Hayat A. Al Akoum SMA, Hikmat A. Akoum, Abir A. El Abed, Pascale R. Salameh. Patient Safety Knowledge and Compliance Among Nurses In Public Hospitals In

Lebanon. *IOSR Journal of Nursing and Health Science (IOSR-JNHS)*. June 2022 2022;11(3 Ser. VI (May. – June. 2022)):11. doi:10.9790/1959- 1103064050

68. (JCI) JCI. Joint Commission International Accreditation Standards for Hospitals (7 ed.). https://www.jointcommissioninternational.org/-/media/jci/jci-documents/accreditation/hospital-and-amc/jci-errata-standards-only_7th-ed-hospital.pdf

69. El-Jardali F, Jamal D, Dimassi H, Ammar W, Tchaghchaghian V. The impact of hospital accreditation on quality of care: perception of Lebanese nurses. *International Journal for Quality in Health Care*. 2008;20(5):363-371. doi:10.1093/intqhc/mzn023

70. El-Jardali F, Fadlallah R. A review of national policies and strategies to improve quality of health care and patient safety: a case study from Lebanon and Jordan. *BMC Health Serv Res*. Aug 16 2017;17(1):568. doi:10.1186/s12913-017-2528-1

71. (MOPH) TLMoPH. Revised Hospital Accreditation Standards in Lebanon- December 2022. <https://www.moph.gov.lb/en/Pages/3/20553/-revised-hospital-accreditation-standards-in-lebanon-december-2022>

72. El-Jardali F, Jaafar M, Jamal D, Rabbaa S. Integrating patient safety standards into the accreditation program: a qualitative study to assess the readiness of Lebanese hospitals to implement into routine practice. *J Patient Saf*. Sep 2012;8(3):97-103. doi:10.1097/PTS.0b013e318258ca70

73. Schibler C. Les enjeux de l'hospitalisation privée. *Les Tribunes de la santé*. 2023;76(2):85-92. doi:10.3917/seve1.076.0085

74. Berwick DM, Calkins DR, McCannon CJ, Hackbarth AD. The 100,000 lives campaign: setting a goal and a deadline for improving health care quality. *Jama*. Jan 18 2006;295(3):324-7. doi:10.1001/jama.295.3.324

75. Saleh S, Sleiman J, Dagher D, Sbeit H, Natafghi N. Accreditation of hospitals in Lebanon: Is it a worthy investment? *International journal for quality in health care : journal of the International Society for Quality in Health Care / ISQua*. 02/13 2013;25doi:10.1093/intqhc/mzt018

76. Ammar W, Khalife J, El-Jardali F, et al. Hospital accreditation, reimbursement and case mix: links and insights for contractual systems. *BMC Health Services Research*. 2013/12/05 2013;13(1):505. doi:10.1186/1472-6963-13-505

77. Dayekh AY, Naseridine M, Dakroub F, Olleik A. Impact, obstacles and boundaries of patient partnership: A qualitative interventional study in Lebanon. *PLOS ONE*. 2022;17(7):e0270654. doi:10.1371/journal.pone.0270654

78. Cervero RM, Gaines JK. The impact of CME on physician performance and patient health outcomes: an updated synthesis of systematic reviews. *J Contin Educ Health Prof.* Spring 2015;35(2):131-8. doi:10.1002/chp.21290
79. Organization WH. Global Patient Safety Action Plan 2021-2030. <https://www.who.int/publications/i/item/9789240032705>
80. World Health O, Safety WHOP. Patient safety curriculum guide: multi-professional edition. World Health Organization; 2011.
81. WHO. Global Ministerial Summits on Patient Safety. <https://www.who.int/teams/integrated-health-services/patient-safety/policy/global-ministerial-summits-on-patient-safety#:~:text=The%20Fourth%20Global%20Ministerial%20Summit,the%20global%20patient%20harm%20burden.>
82. Abu-Saad Huijer H, Sallian SD, Fares S, Bassila J. Predictors of quality of life in older adult patients in Lebanon: a cross sectional study. *Ann Palliat Med.* Mar 2023;12(2):356-364. doi:10.21037/apm-22-619