AMERICAN UNIVERSITY OF BEIRUT

SURVEY OF REGISTERED NURSES 'AND NURSES IN MANAGEMENT POSITION'S PERCEPTIONS OF THE SAFETY CULTURE AT AUBMC

by
AIMEE BECHARA KHALED

A project
submitted in partial fulfillment of the requirements
for the degree of Master of Science in Nursing Administration Track
to the Hariri School of Nursing
of the Faculty of Medicine
at the American University of Beirut

Beirut, Lebanon
April 2014

AMERICAN UNIVERSITY OF BEIRUT

SURVEY OF REGISTERED NURSES 'AND NURSES IN MANAGEMENT POSITION'S PERCEPTIONS OF THE SAFETY CULTURE AT AUBMC

by

AIMEE BECHARA KHALED

Approved by:

Michael Clinton

Dr. Michael Clinton, Professor
Hariri School of Nursing
First Reader

Noureddine

Dr. Samar Noureddine, Associate Professor
Hariri School of Nursing
Second Reader

Date of project presentation: April 23rd, 2014.

AMERICAN UNIVERSITY OF BEIRUT

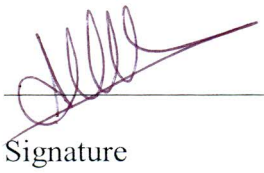
THESIS, DISSERTATION, PROJECT RELEASE FORM

Student Name:	Khaled	Aimee	Bechara
	Last	First	Middle

◯ Master's Thesis ◉ Master's Project ◯ Doctoral Dissertation

☐ I authorize the American University of Beirut to: (a) reproduce hard or electronic copies of my thesis, dissertation, or project; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes.

☑ I authorize the American University of Beirut, **three years after the date of submitting my thesis, dissertation, or project,** to: (a) reproduce hard or electronic copies of it; (b) include such copies in the archives and digital repositories of the University; and (c) make freely available such copies to third parties for research or educational purposes.



Signature

May 13, 2014

Date

ACKNOWLEDGMENTS

I would like to acknowledge and extend my deepest gratitude to Dr. Michael Clinton and to my faculty advisor Dr. Samar Noureddine. I am so grateful for your kind guidance, availability and continuous support during this project and throughout my Masters' studies. I would also like to thank Dr. Souha Fares, for her guidance and support in helping me with the sophisticated statistical issues of this project; I am truly grateful for her help.

I would like to thank my parents and my lovely husband Bassam for bearing with me and supporting me all throughout the work of my Masters. Without your support, my work would not have been possible. Finally and with all my heart, I dedicate my Master's project to my two lovely and intelligent sons, Matthew and Michael. You are my precious boys and I encourage you to reach the highest levels of education, God willing. Education for the progression of the common good is a work for God; this is what nursing is about.

AN ABSTRACT OF THE PROJECT OF

Aimee Bechara Khaled for Master of Science
Major: Nursing

Title: Survey of Registered Nurses 'and nurses in management position's perceptions of the safety culture at AUBMC.

Safety culture has become a particular focus of healthcare systems and hospitals since the publication of the Institute of Medicine (IOM) report, "To err is human" in 1999. This study was conducted in order to assess AUBMC readiness for further development of its patient safety culture. More specifically, the purposes of the study were to describe Registered Nurses and nurses in administrative positions' perceptions of the patient safety culture at AUBMC, to compare the perceptions of the two groups of nurses (RNs and nurses in administrative positions) and to compare the perceptions of the study sample with the norms published in the Agency for Healthcare Research and Quality (AHRQ) 2011 US benchmarking database. The study also explores the relationship between perceptions of transformational leadership and the AUBMC safety culture by category of nurse (RN vs. nurses in administrative positions).

The study was conducted as a cross sectional survey of RNs and nurses working in administrative positions including nurse educators. Usable questionnaires were returned by 260 respondents. The survey was conducted using the Hospital Survey on Patient Safety Culture questionnaire HSOSC) and the Global Transformational Leadership Scale (GTL).

On average, the percentage of positive HSOSC scores (57.6%) were lower than published AHRQ norms (63.2%). Percentage positive responses were lower for AUBMC on nine of the twelve HSOSC composites, however the differences were not significant, ($p=0.311$). There was a significant difference in the number of safety events reported by RNs and the nurses in the administrative group ($p=0.000$). RNs (66.4 %) and nurses in the administrative group (74.1%) rated the transformational leadership characteristics of their direct manager/supervisor positively ($p=0.025$). Total transformational leadership score was found to have a significant association with total safety score in a linear regression model, ($\beta = 1.825$, $p=0.000$).

This study gave a clear overview of perceptions of the safety culture at AUBMC and implies suggestions for further improvement. The study indicates the need for further research into this topic in Lebanon.

CONTENTS

Appendix

ILLUSTRATIONS

Figure Page

TABLES

To My

Two Lovely and Intelligent Sons,
Matthew and Michael.

CHAPTER I

INTRODUCTION

Safety can be defined as a condition where people are spared from harm, errors and unplanned accidents. Error can be described as something that stops an intended act from being achieved as planned or achieving a planned act the wrong way (Ugurluoglu, Ugurluoglu, Payziner and Ozatkan 2012). Errors can occur any time while taking care of a patient. Safety measures attempt to secure the environment in a way to avoid unintentional occurrences (Ugurluoglu *et al*. 2012).

Since culture is the totality of a society's values, beliefs and practices, the concept of safety culture is generally understood as individual and organizational performance with respect to the safety of employees and customers. Safety culture has become a particular focus of healthcare systems and hospitals since the publication of the Institute Of Medicine (IOM) report, "*To err is human*" in 1999. Nie, Mao, Cui, He, Li, and Zhang (2013) explain that within the context of health care, safety culture means individual and organizational adherence to common principles and values designed to decrease the chances of patient injury (Nie *et al*. 2013). "Safety Climate" is sometimes used interchangeably with "safety culture", yet there is no consensus that safety climate is equivalent to safety culture. After reviewing several definitions about safety climate, Wiegmann, Zhang, Von Thaden, Sharma and Mitchell in 2002, derived the following definition of safety climate:

"Safety climate is the temporal state measure of safety culture, subject to commonalities among individual perceptions of the organization. It is therefore situationally based, refers to the perceived state of safety at a particular place at a

particular time, is relatively unstable, and subject to change depending on the features of the current environment or prevailing conditions" (Wiegmann *et al*. 2002, 10).

Chen and Hui (2010) recognized the fact that safety culture helps an organization deal openly with problems as they occur; safety culture is constructive, directed towards fixing system errors and not blaming individuals (Chen and Hui 2010). In order to promote safety, healthcare systems need to first understand their internal culture. Such understanding can be provided by the use of a safety culture assessment tool. Based on the assessment results, appropriate strategies are then recommended to promote the safety culture. Safety culture assessment tools can be used as a start to recognize areas for improvement and prioritize which problem is thought to be more challenging than others (Ugurluoglu *et al*. 2012).

A. Significance

Interest in the safety cultures of hospitals and other healthcare facilities has increased since the publication of *'To err is human'* (IOM 1999). In *this* report it was estimated that medical errors cause 98,000 deaths per year in the US. This report has become a guiding force for the quality movement in healthcare and many hospitals and other facilities are acting on its recommendations by improving their safety cultures with the intention of lowering the number of unnecessary deaths. This report became a critical component of health care quality. Another policy document that enhanced the establishment of solid patient safety systems is a report that was published in the UK by the Department of Health, '*An organization with a memory'.* Both reports described how attitudes and behaviors of employees can be positively affected by an organizational culture that fosters safety (Mohammadreza, Sogand and Omid 2010).

The leadership commitment to quality and safety, staff knowledge and

essential organizational structures are considered fundamental for establishing safety and quality patient care (Joint Commission International [JCI] 2008). It is crucial for senior leadership and hospital administrators to recognize the current convictions and views of safety culture among the front line workers, especially nurses. This awareness will help any hospital administration focus its efforts while building its safety culture (Hannah, Schade, Lomely, Ruddick and Bellamy 2008).

The primary aim of this study is to describe the perceived safety culture in the American University of Beirut Medical Center (AUBMC) from the perspective of nurses. This study is innovative in that it also explores the relationship between perceptions of leadership and perceptions of safety culture in an academic medical center. Since AUBMC is Magnet designated, and transformational leadership is a constituent component of the requirements for Magnet designation, the study will examine the relationship between transformational leadership and the nurses' perceptions of the safety culture at AUBMC.

The theory of transformational leadership was illustrated by Bennis and Nanus, who described a transformational leader as "a leader who commits people to action, converts followers into leaders, and who may convert leaders into agents of change" (Bennis and Nanus 1985, 3). Transformational leaders empower followers for a better vision of the institution and foster critical thinking instead of imposing power to control the organization. In nursing, empowerment results in the advancement of patient care. This leadership style was particularly recommended by the IOM in their work on patient safety, as they encouraged adoption of transformational leadership and urged nurse leaders to participate in decision making, represent nursing in the organization, and facilitate contribution of bedside nurses in decision making (Roussel and Swansburg 2009). Promotion of a safety culture in an organization may benefit from

transformational leadership that can enable employees to change their perceptions and facilitate the process accordingly.

The Nursing Quality Improvement Plan is a fundamental component of leadership by Nursing Services at AUBMC and complements the AUBMC Performance Improvement Plan that supports the goals of AUBMC, especially those pertinent to quality and safety; this plan involves instituting a "just culture", a safety culture that acknowledges people mistakes but focuses rather on improving system- induced mistakes. Belief in a 'just culture' is an essential aspect of building a safety culture because system improvement and, consequently, improvements in care delivery and environmental safety depend on staff rewards that are perceived to be transparent and fair (AUBMC, Quality Improvement and Patient Safety Nursing, 001 2013). Moreover, the patient safety and risk management plan at AUBMC fosters proactive risk management, incidents and adverse events occurrence reporting, monitoring and analysis of patient safety occurrences; trending and benchmarking of patient safety information, as well as reporting and intervening to solve patient safety issues (Patient Safety and Risk Management, AUBMC, QPS-MUL-001 2013).

The above features at AUBMC highlight patient safety as a priority in the hospital. However, staff beliefs regarding patient safety are not assessed regularly. The latest assessment took place in September 2007, when all nursing staff were surveyed using the Hospital Survey on Patient Safety Culture (HSOPSC or HSOPC) developed by the Agency for Healthcare Research and Quality (AHRQ). The response rate was 53%; some composite scores were higher than USA data of comparable hospitals, yet this survey was not repeated afterwards. This survey is recommended to be repeated yearly by the Agency on Health Research and Quality (AHRQ). Moreover, the last JCI accreditation dates back to 2008 and the Magnet designation of AUBMC was achieved

in 2009; a great emphasis was put by the administration on safety and transformational leadership since then. Policies regarding safe care of patients are ongoing mainly since 2006; those policies are multidisciplinary and up to date as tackled by both the nursing department and the risk management department at AUBMC.

CHAPTER II

LITERATURE REVIEW

A variety of tools that measure safety culture are present in the literature but those instruments' domains vary from one tool to another, which poses a challenge in choosing the proper tool; for instance, some well cited and reliable tools like the "Patient Safety Climate In Healthcare Organizations" and the "Safety Climate Scale" actually measure "safety climate" rather than "safety culture" and, as explained earlier, those two concepts are not the same. The scales found in the literature that measure "patient safety culture" in particular were mainly adopted from other high risk industries such as aviation industry. In a comprehensive review of the literature, ten scales were found, yet some of those scales were either not described enough in the literature or lacked psychometric analysis, namely the Stanford Safety Culture Instrument, Patient Safety Culture Improvement Tool, Safety Organizing scale, Hospital Culture Questionnaire, Safety Attitudes Questionnaire, Manchester Patient Safety Assessment Framework, Patient Safety Culture Questionnaire, Patient Safety Culture In Healthcare Organizations Survey, Teamwork And Patient Safety Attitudes Questionnaire and the Hospital Survey On Patient Safety Culture .

The Safety Attitudes Questionnaire (SAQ) is a well cited scale in the literature; it is a modification of a scale called The Intensive Care Unit Questionnaire. The SAQ tackles six safety domains: safety climate, teamwork climate, stress recognition, perceptions of management, work conditions, and job satisfaction. The SAQ is commonly used in healthcare. Its psychometric properties are acceptable as tested and its reliability Cronbach alpha coefficient is 0.9 (Sexton, Helmreich, Neilands, Rowan,

Vella, Boyden *et al.* 2006). Despite the use of such scales and other scales in healthcare for assessment of safety culture, data of such hospitals could not be compared to other hospitals; those scales are not entirely available on line and hospital data cannot be compared because the scales used are different.

A. Studies using the Hospital Survey on patient safety culture

The most cited survey on patient safety culture is the Hospital Survey On Patient Safety Culture (HSOPSC or HSOPS) developed by the Agency for Healthcare Research and Quality's (AHRQ); it is one of a few valid instruments that measure safety culture among healthcare providers and has been widely used since 2004 and is available for free on line at the AHRQ website (Appendix II). Appendix I shows the modified HSOPC that was used in this study. The HSOPSC consists of nine sections that address 12 dimensions or composites covered in 42 items. This survey addresses mostly employees' judgment about issues related to patient safety, medical errors and reporting of events; it was translated to 24 languages and was used in 45 countries worldwide (Nie *et al*. 2013). Yearly surveys are recommended by AHRQ as healthcare areas can always progress.

From the literature reviewed, most of the studies using HSOPS compared their results to the AHRQ benchmarking databases for each of the 12 composites, the total patient safety grade, and the frequency of events reported. Some composites' positive responses were lower than AHRQ average and some others were higher. Common positive answers were noted between studies for some composites such as teamwork. Most of the investigators conducted comparisons across professions but few were the studies that focused on comparisons across levels within the nursing profession.

Translated versions of HSOPS were used in Iran by Mohammadreza, Sogand

and Omid (2010), and Arabloo, Rezapour, Azar and Mobasheri (2012) who administered it in five university hospitals. Both investigator groups compared their results with AHRQ databases 2004 and 2010 respectively. Arabloo *et al*. found that overall perceptions of patient safety were lower in nurses than other professionals ($p < 0.05$); the same applies to teamwork across units. The authors reported correlations that varied between (0.087 and 0.457) with the highest correlation being between events reporting, patient safety grade and management support for patient safety. Internal consistency reliability was determined as low in the Iranian version of the HSOPSC. Some dimensions' reliability coefficients were < 0.7 such as communication about error. The overall safety score of those hospitals was 55.7%; cross professional comparisons were conducted and varied according to each dimension (team work within units had the highest value, 65%, as compared to the other safety dimensions). On the other hand, Mohammadreza *et al*. study showed that although management claimed being enthusiastic about safety issues, the staff did not perceive this eagerness from the management. The authors concluded the hospital environment to be pleasant from the high scores of teamwork within units (71% positive responses) (Mohammadreza *et al*. 2010).

Nie, Mao, Cui, He, Li and Zhang (2013) used a Chinese version of the HSOPS among healthcare workers, mainly physicians and nurses from 32 hospitals. The tool had a Cronbach alpha of 0.84. Nurses scored differently than physicians in eight of the twelve dimensions; mainly the nurses had higher positive responses than physicians except in two dimensions. There were also differences among physicians with different levels (resident, physician and chief physician). Positive responses were higher than the AHRQ comparative database 2007 on five dimensions of the survey ($p<0.05$); in general all responses were close to the USA benchmark. Differences in responses were

interpreted by the authors as being related to cultural differences between countries (Nie *et al.* 2013).

A translated Chinese version of HSOPSC was also used by Chen and Li (2010) to survey 42 teaching hospitals in Taiwan using a random sample 1000 staff, composed mainly of nurses (600), physicians (300) and administrators (100). Demographics were compared among supervisors (92.5% of the sample), and non-supervisors, with supervisors including, physicians, administrators and people not in direct contact with the patient. Using t-test, the authors found that on average positive responses were higher than those of the AHRQ data (64% vs. 61%); the lowest positive responses were in the staffing dimension (37% vs. 42% in the AHRQ data), similar to the findings of Nie *et al.* Besides, Chen and Li, who also brought up the issue of cultural diversity that affects the responses on the survey, especially in translated versions (Chen and Li 2010).

Ugurluoglu, Ugurluoglu, Payziner and Ozatkan (2012) assessed healthcare workers' perceptions of patient safety in a 900-bed university hospital in Turkey using the HSOPSC survey translated into Turkish. Forty three percent of the respondents were nurses. Comparisons between staff categories on the twelve safety dimensions were conducted to include nurses, doctors, and other health professionals. Results showed that staff who had 16 years of experience and more gave higher scores for management support for patient safety, whereas teamwork within units was perceived to be more positive in respondents with 5- 16 years of work experience. The data were benchmarked with the 2010 AHRQ database. Discrepancies in positive responses were noted between Turkish answers and USA comparative database in many dimensions; the average positive response rate was 43% vs. 59% in the AHRQ database, with the highest positive responses noted in the teamwork within units dimension (72%) while

the rest of the responses were significantly less positive than AHRQ database; the authors attributed this gap to cultural differences, just like Chen and Li (2010) and Arabloo (2012) (Urgurluoglu *et al*. 2012).

In a study funded by AHRQ, Hannah and colleagues (2008) surveyed 29 hospital's patient safety culture in West Virginia using the HSOPSC. Their study was over a three years period and they repeated the measurements twice, and the second measurement took place midway through the study. Participants were divided based on their positions whereby front line staff constituted 33.6% and 33.7% of respondents at measurement and re-measurement; while the administrative group represented 16.9% and 13.1% of respondents at measurement and re measurement, respectively. Front line staff, mainly nurses, tended to rate safety dimensions less positively than administrative staff consistently in both measurements; this was also evident in the overall safety perceptions (the administrative group scored 12% and 14% higher in measurement and re measurement respectively than the nurses' group). The biggest gap was observed in the dimension addressing the "management support for patient safety", where the administrative group scored 23 and 20% higher than front liners in both measurements; "non punitive response to error" also had a high discrepancy of 12 and 14 % difference between the two groups. Overall, the positive responses of those hospitals were higher than the AHRQ ones in five dimensions for both groups, and in ten dimensions for the administrative group. The authors concluded those differences to be pinpointing the need for interventions tailored at improving safety culture among hospital staff. The authors also recommended further studies and analysis exploring the differences in responses between nursing and administrative staff in future research (Hannah *et al*. 2011).

As noted above, many studies in the US and other countries explored the

safety culture in hospitals among nurses, physicians and administrators. Differences were noted between countries/cultures, as well as between professional groups within the same culture. Of particular interest was the difference noted in the perception of nurses and managers on safety culture aspects within the same organization. The studies listed in this literature, namely those undertaken by Mohammadreza *et al*. and Hannah *et al*., justify the need to replicate this survey at AUBMC and assess the leadership involvement in patient safety as perceived by the staff, taking also into consideration the nature of AUBMC as a medical center and its focus on the nursing services. The survey for this study was modified to exclude other health care workers and focus on front line nurses who are in direct contact with patients (RNs), and nurses in the administrative team comprising diverse managerial positions such as: Nurse Managers (NMs), Clinical Educators (CEs), Advance Practice Nurses (APNs), Nurse Quality Managers (NQI), Nurse Clinical Leaders (NCL), Magnet Coordinator, executive assistant, and the nurse shift administrators (NSAs). (Other staff positions stated in Appendix II section H4 of the original HSOPSC such as physicians, pharmacists, PNs, are excluded). The administrative team has in fact a pivotal role in cultivating quality and safety culture across the hospital and monitoring safety outcomes, so it is crucial to examine their perceptions versus front liners' perceptions regarding patient safety culture and comparing the results also with the AHRQ database.

Restricting the sample to AUBMC professional nurses, RNs and nurses in managerial positions, would spare the authors from translating HSOPC into the Arabic language as those nurses are supposed to be fluent in English viewing their educational level. Translation into Arabic could have possibly caused decrease in reliability of the instrument as reported by El-Jardali, Dimassi, Jamal, Jaafar and Hemadeh (2011).

A ladder for safety culture was developed by Hudson and van der Graaf in

2002; organizations interested in patient safety can climb the five levels of this ladder. The lower level is named “pathological”, where the staffs are negligent and claim not caring as long as they are not trapped. At the second level, the staffs acknowledge the importance of safety and the waste of time they face while investigating an accident; this level is named “reactive”. At the third level, the staff admits the existence of systems managing safety but they serve only to please the regulations and the system; this level is named “calculative” and is thought to be the level in between a generative and a pathological culture, a level where safety receives attention. The fourth level is “proactive”; this level acknowledges the existence of problems and is still working on improvement. The fifth and ultimate level is the “Generative” level, where safety improvement is continuous and a priority that is incorporated in all parts of the business (Hudson 2001). The percentage of positive answers obtained by both managers and Registered nurses through this survey would provide a general idea about where AUBMC nurses stand from this ladder and directs efforts toward quality improvement in future studies.

B. Transformational Leadership and Safety Culture

Being part of a Magnet designated hospital since 2009 by the Magnet recognition program, AUBMC Nursing services department fosters excellence and high quality of care while delivering care to patients. Quality improvement requires commitment from all medical center staff; particularly nurses in Magnet designated hospitals because evidence of quality improvement is required to achieve recognition as a Magnet facility. Transformational leadership is a second requirement for Magnet designation. It seems reasonable to expect that Transformational leadership will have a positive effect on safety culture; the more nurses experience and are engaged in

transformational leadership, the more positive their attitude to the safety culture of their hospital. Including an assessment of perceptions of transformational leadership in the AHRQ survey at AUBMC adds an important dimension to this study in that it provides an opportunity to test the proposition that transformational leadership has a positive impact on nurses' perceptions of safety culture. For this reason, a short transformational leadership questionnaire, the Global Transformational Leadership Scale (GTL) developed in 1990 (Podsakoff, Mackenzie, Moorman and Fetter 1990) was added to the section on supervisors in the survey (Appendix I, section B). The GTL consists of seven items that tackle the leader's behaviors, namely communicating a vision, staff development, granting support for the staff, empowerment, innovative thinking, leading by example and charisma such as inspiring pride in subordinates.

From the literature and patient safety definitions listed above, we can infer that the individual and the leadership engagement with the safety culture foster protection of the welfare of customers and staff. Actually, such behaviors require inspiration of staff at all levels in order to advance the safety agenda in an organization through finding solutions to safety issues. All these attributes of employees are more likely to occur when Transformational Leadership (TL) is a defining characteristic of the organization. Actually, TL being a requirement of Magnet designated facilities, such as AUBMC, RNs and nurses in managerial positions are expected to demonstrate a high level of commitment to safety through their positive responses to the modified version of HSOPS (Appendix I).

The role of senior leadership in the promotion of patient safety culture and safety outcomes is frequently supported by studies in the literature (Squires, Tourangeau, Laschinger and Doran 2010). The role of Transformational leadership attributes in senior management in improving patient safety was studied in a nationwide

survey in the US by McFadden, Henagan and Gowen in 2009. The authors hypothesized that the adoption of a transformational leadership style at high levels of the organization increases support of a chain directed towards improving patient safety, the "patient safety chain". Their first hypothesis was a positive association between TL and patient safety culture; they suggested initiatives such as adoption of partnership with stakeholders, open discussions of errors, safety training to employees, and a change of thinking about errors from causes to consequences, and most of all a blame free environment for reporting. In brief, the authors hypothesized a path for patient safety chain and a model that uses patient safety culture (PSC) as a mediator between TL and patient safety initiatives (PSI) in order to reach patient safety outcomes (PSO).The authors used a questionnaire and phone interviews from 212 hospitals; they measured TL behaviors such as the charismatic dimension of a leader in addition to the three other constructs' of the study, PSC, PSI, and PSO. Cronbach alpha reliability of the TL measure and the other three constructs ranged between 0.80 and 0.93. Results of the study supported all hypotheses and the authors recommended the practice of TL style by all organizations and additional research on TL and other leadership styles on PSC (McFadden *et al*., 2009).

The main aim of this study is to assess AUBMC readiness for further development of its patient safety culture. More specifically, this study will describe AUBMC Registered Nurses' perceptions of patient safety culture and the perceptions of AUBMC nurse administrators on patient safety culture. The study shall compare the perceptions of the two groups with each other and against AHRQ 2011 US benchmarking Data base, which is the latest published database by AHRQ.

C. Theoretical framework

The theoretical framework used for this study is the safety culture framework developed by Ekenedo in 2013 (Figure 1).

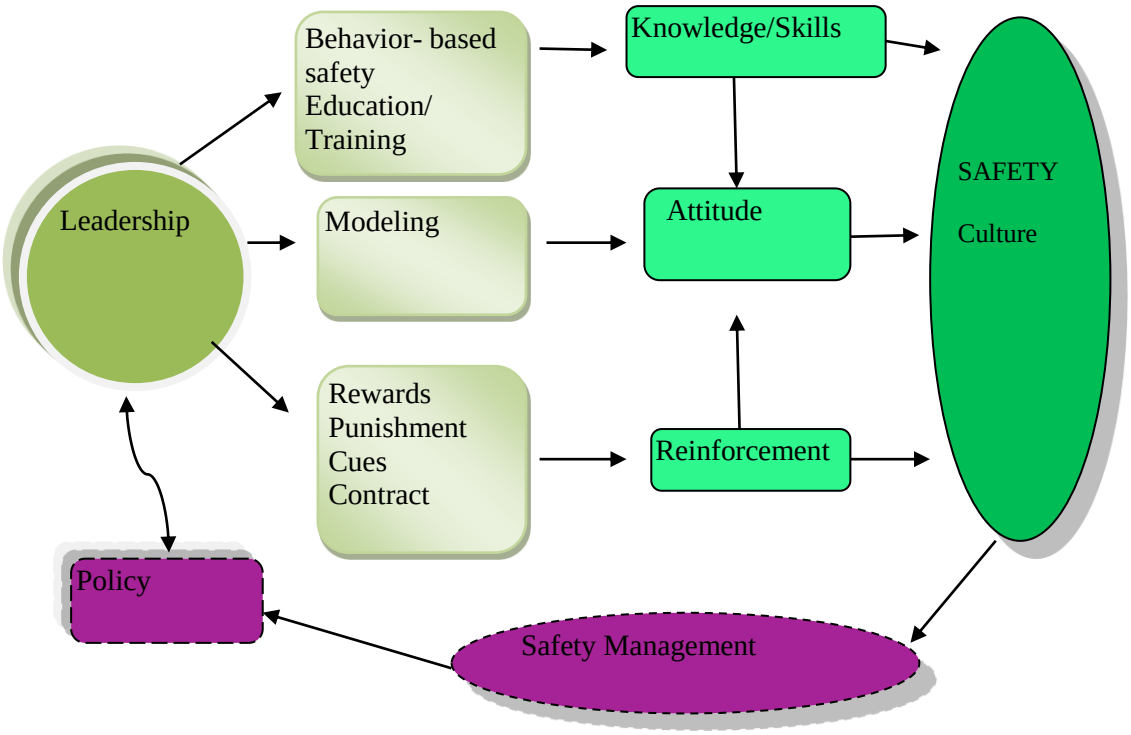


Fig. 1. Safety culture framework

This framework was chosen as it stresses on the leadership role in creating and nurturing the culture of safety. For Ekenedo, safety culture is created by giving value to leadership, and thus, it is placed at the core of the framework. Leaders are thought to facilitate safety practices through education and training that in turn will modify behaviors; leaders will be "modeling" safety through adoption of a positive attitude and "leading by example". Leaders also drive safety culture through stimulating and emphasizing safety practices that go together with the policies originating from the safety system management in three behaviors: Education of safety skills, attitude

change, and reinforcement of work safety by leadership through cues, rewards, and punishment as needed in order to foster positive safety culture. The above interactions will lead to a safety culture and a safety management system that is supported by policies reflecting the leadership.

A safety management system (SMS) focuses on hazards and safety aspects of an organization that are a sequence of clear processes across the organization. SMS affords successful decision making that is risk-based and connected to the daily business. The main processes are: reporting hazards and occurrences that helps in acquiring data on safety, risk management through risk assessment and control, measurement of performance to check compliance with the safety aims of the organization, and finally quality and safety assurance that insures continuity in the safe performance of the institution (Ekenedo 2013).

According to Ekenedo (2013), it is the leadership main duty to indicate the need for, promote and maintain a firm safety culture. Senior managers should inspire their staff and propose a safety vision. Commitment to this vision is also required through "leading by example"; this requires prompt recognition and correction of situations that are not safe. Not only upper management needs to establish and nurture this vision, but also to hold every member of the organization accountable for safety, from the lowest to the highest positions. Success is the focus of such managers rather than failure. For instance, keeping record of weekly safety rounds, tracking the advancement in safety training, reviewing the new ideas suggested for safety improvement are examples of "success".

With a safety-oriented leadership, safety discussions need to be conducted on daily basis with the staff; unsafe practices must be taken seriously especially that deficiencies in management's control are the main causes of errors and accidents; also

safety training shall be ongoing as well as acknowledgment of safe behaviors. Ekenedo believes that knowledge acquired through training enables the staff to behave safely and avoid errors and risks of the job; however, knowledge is not enough to change the behaviors of staff. Staff attitudes play a major role, and those attitudes are affected by the organizational safety climate that is cultivated by senior leadership.

The literature suggests that transformational leadership has some positive impact on patient safety culture; yet there were not enough studies about this relationship. Surveying and comparing different levels of nurses using both a patient safety culture measuring tool and a TL measuring tool would add uniqueness to this study and direct efforts toward quality improvement at AUBMC in the future.

The research questions that will be addressed are the following:

- Are the results on the HSOPS for AUBMC nurses comparable to the 2011 US hospitals 'AHRQ data base? In which subscales?
- Are there significant differences between Registered Nurses perceptions of safety culture and those of the nurses in the management group?
- Do participants who have higher perceptions of transformational leadership also rate AUBMC's safety culture more positively, and does this differ between RNs and nurses in administrative position.

CHAPTER III

METHODOLOGY

The study design is descriptive cross sectional.

A. Study Population

The target population included the bed side professional nurses, i.e. the Registered Nurses (RNs) and the RNs in higher positions working in nursing administration and education at AUBMC. Practical nurses and Nurse Aids (auxiliary staff) were excluded from this study in order not to have to translate the survey into Arabic and because they may not be aware of all the aspects of the questionnaire considering their level of education.

The total number of RNs and nurses in higher positions at AUBMC is the following: 585 RNs, and 68 RNs in management positions distributed as follows: five nurse leaders (NLs), 28 nurse managers (NMs) , two assistant nurse managers (ANMs), six nursing supervisors (NSAs), three nursing quality managers (NQM), nine clinical educators (CEs), five clinical nurse specialists (CNSs), two case managers (CMs), a transfer center case manager, an executive assistant, a Magnet project coordinator, and a life support coordinator (Communication with Ms. Maya Nizam, executive assistant for the nursing director, October 2013).

B. Sample

Convenience sampling was used in this study. A total of 325 that is roughly half of those bed side nurses and nurses in administrative positions were sent

questionnaires as they met the eligibility criteria to participate in this study. Non probability sampling was used whereby nurses selected themselves to be enrolled in the study. Taking into consideration the annual leaves and the weekly off days of the nurses during the survey period, we estimated a response rate of 50%, that is 160 completed questionnaires returned. However, of the 325 questionnaires distributed, 260 were returned, with a response rate of 80%.

C. Instrumentation

The questionnaire used in this study is mostly based on the Survey on Patient Safety Culture (HSOPSC or HSOPS) developed by AHRQ in 2004 (Appendix II).

Section H of the survey was replaced by the background section for clarity purposes as per the recommendations of the Institutional Review Board (IRB). In the modified survey, all categories of healthcare workers were excluded, so the survey was restricted to include only nurses as follows: part 1 for RNs, part 2 for nurses in administrative positions (Appendix I) and part 3 common between the 2 categories. The seven items of the Global Transformational Leadership Scale developed in 1990 by Podaskoff *et al*. were added to section B of HSOPSC addresses the supervisors/managers were added the seven items (Appendix I, Section B, question 5-11). The last modification made was adding one sentence at the end of the survey reminding the respondents not to mention their names or exact position.

The instrument was administered in the English language only, since English is the language practiced the most at AUBMC. Even though some nurses are French educated, all the nurses are professional nurses and recruited to AUBMC based on their fluency in English.

1. The Hospital Survey on Patient Safety Culture

The 12 dimensions/composites of the survey and their explanations are : (1)"Overall perceptions of patient safety"; (2)"frequency of events reported" ; (3)"Supervisor/manager expectations and actions promoting patient safety" ; (4)"Organizational learning", this dimension reflects how mistakes are used as learning opportunities and how they can lead to positive changes in the organization; (5) "teamwork within units"; (6)"Communication openness", demonstrates how comfortable the staff are in questioning those with higher authorities about things they perceive affecting negatively a patient; (7) "feedback and communication about error", which reflects how informed the staff are about errors and how they are given feedback about subsequent action plans applied to prevent new occurrences ; (8) "Nonpunitive response to error", reflects how staff mistakes are not used to criticize them and /or just to be kept in their files; (9) "staffing", this dimension shows to which degree staff is adequate to carry the load of work and that work hours are enough to care for patients ; (10) "Management support for patient safety" that reveals how management assures a climate that prioritizes patient safety; (11) "Teamwork across units"; and (12) "Handoffs and transitions", which addresses how patients' related information are conveyed among hospital units and during inter shift reports. Each of these composites includes three to four items and the total number of items is 42 (Hannah, Schade, Lomely, Ruddick and Bellamy 2008). Most of the questions are answered on a five-point Likert scale of agreement ranging from "strongly disagree" to "strongly agree" or by frequency from "never" to "always" (2 sections), one item "overall patient safety grade" is graded on a 5-point Likert scale from excellent to failing.

The reported internal consistency reliability coefficients of the HSOPS varied between subscales with Cranach alpha coefficient values ranging between 0.4 and 0.88,

with the staffing subscale having the lowest reliability (Nie *et al*. 2013). Blegen, Gearhart, O'Brien, Sehgal and Alldredge also conducted psychometric analyses of the HSOPSC; seven out of the twelve dimensions had a Cronbach alpha value of at least 0.7, while the staffing dimension remained the lowest (0.6 for nurses) (Blegen *et al*. 2009). The internal consistency of the Arabic version of the HSOPS was even lower than that of other studies, Cronbach alpha was mainly in the range of 0.45- 0.6 for most of the composites, with only two composites scoring 0.7- 0.8 (El-Jardali *et al*. 2011). Actually that study was conducted using the HSOPS in Lebanese hospitals; it included 6807 healthcare workers including physicians, nurses, and pharmacists (El-Jardali *et al*. 2011).

Sorra and Dyer in 2010 examined HSOPS psychometric properties using the 2007 AHRQ database. The analyses were done individually, as well as nested by hospital and unit of service Cronbach alpha coefficients ranged between 0.62 and 0.85. The lowest Cronbach alpha was for the staffing composite (0.62), the rest of composites averages were greater than 0.7, with the highest being for the teamwork within units' (0.83) and frequency of 'events reporting' (0.85). Sorra and Dyer (2010) also performed individual level factor analysis and "factor loadings" were calculated for 42 items. The cutoff for factor loadings was greater than or equal to 0.4; the results showed that it ranged between 0.59- 0.92, which supported the composites with an average of 0.80. The authors also inspected the % of variance designed for by factors and was set acceptable as greater than or equal to 50%, results revealed a variance on average 64%, with all factors scoring above 50% except the staffing composite that was 47%.

Intraclass correlations (ICCs) were also examined and showed 6- 23% of unit level variance in individual responses, which the authors stated could be an effect of unit membership that affected how respondents are answering the survey. Hospital level

analysis showed that 2-10% of the variance was related to the hospital membership. Design effects were also explored for the unit level with number 2 being the threshold for group relationship to have an effect on responses of persons; all design effects were greater than 2 at the unit level, they ranged between 2.19 and 5.89 with an average of 3.10.

Sorra and Dyer (2010) also did confirmatory factors analyses and the results showed good fit of the data to the six composites that had more than three items each. Those results held when the analyses were done at the unit and hospital levels. Intercorrelations among composites were also explored at the individual, unit and hospital levels and were moderate to strong. Intercorrelations were highest between "patient safety grade" and "overall perceptions of patient safety" (0.66- 0.73);this supported the construct validity of HSOPSC in its dimensions. Correlations between the composite scores and the Patient Safety Grade were significant, averaging 0.42 (range 0.37 to 0.66), further supporting the validity of the HSOPSC (Sorra and Dyer 2010).

2. The Global Transformational Leadership Scale (GTL)

GLT is a short questionnaire on transformational leadership that includes seven items that are answered on a 5-point Likert scale ranging from strongly disagree to strongly agree. This scale was used because it is not time consuming like other scales such as the Multifactor Leadership Questionnaire (MLQ) and the Leadership Practices Inventory (LPI). This scale is described in the literature as reliable and valid; it focuses on six leader's behaviors.

In 2000, Carless and Mann explored the psychometric properties of the GTL in a sample of 1440 subordinates and 66 district managers in Australia. Principal component factor analysis showed that the GTL had one factor, explaining 71% of the

variance in scores. The factor loadings were 0.78-0.88. A confirmatory factor analysis using maximum likelihood was conducted and confirmed the finding of one factor for the GTL.

Convergent validity of the instrument was also studied through calculation of correlations between GTL and the sub-scales of both the LPI and MLQ. Correlations were high (0.71- 0.87), which implies that the GTL matches with LPI and MLQ that are valid and reliable measures. Discriminant validity was also explored using t- tests and checking if this instrument differentiates between distinct groups, such as highly and weakly performing managers; the results demonstrated that the GTL is able to discriminate between different groups (t: 5.47- 7.57 at $p<0.01$). Reliability of the GTL was supported by a Cronbach alpha of 0.93 (Carless and Mann 2000).

The demographic section of the questionnaire (Background Part 3) includes: direct interaction with patients, years of experience in nursing, years of experience in the same hospital, years of experience in the same hospital unit and number of working hours per week.

D. Procedures

This study was approved by the Social and Behavioral sciences IRB at the AUB; the main concern of the IRB was to protect the privacy of the participants. Respondents were instructed not to specify their position in the questionnaire so that they are not identified. Following expedited IRB approval, the study was approved by the AUBMC medical director and the director of nursing.

This cross sectional survey included a total of 325 packages each containing the modified survey (Appendix I), an information sheet inviting participants to respond to the study (Appendix III), an informed consent (Appendix IV), and a return envelope.

After obtaining approval of the IRB and the hospital/nursing administration, packages were deposited in a box on the nurses' station of each patient unit for RNs and nurse managers and in boxes in the hospital administration office and the Clinical and Professional Development Center office for other nurses in management positions. The distribution took place by Ms. Khaled, the study coordinator, in a sequential manner from upper to lower floors of the hospital within 24 hours during an evening and a day shift rotation. Upon distribution and during her daily rounds, Ms. Khaled explained the purpose of the study and the instructions available on the information sheet to the nurse manager of each unit and a group of RNs available. She stressed that answered questionnaires need to be returned in a sealed envelope including just the name of Ms. Khaled with no other identifier and deposited in the box. The information sheet was posted on each box to serve as an announcement of the study for better response rates. The packages were delivered twice daily and collection boxes emptied twice daily by Ms. Khaled during a 4 weeks period and were removed from all floors thereafter. Two hundred and sixty questionnaires were collected in the return boxes and analyzed as they were fully completed or included more than 50% of questions answered.

E. Data Analysis

Data were entered and analyzed using SPSS version 20 for Windows. Subscores representing positive averages on each composite were computed according to the AHRQ norms by summing up the percentages of positive responses of each item and dividing them by the number of items in each composite. Positive responses comprised "Strongly agree" and "agree" for items that were positively worded, and "Strongly disagree" and "Disagree" for items that were negatively worded. We also computed a total score by summing up individual scores on the 42 items.

Continuous variables were summarized as means and standard deviations and categorical variables as frequencies and percentages. Subscores were compared between AUBMC and the AHRQ database and between RNs and managers using the independent-samples *t* test. Averages of the positive responses on the transformational leadership items were compared between managers and RNs using the Mann Whitney U test. Each transformational leadership item between managers and RNs was also compared using the Chi square test. Linear regression analysis was carried out to examine the association between the dependent variable "Total scores" and the independent variables: (1) "Nurses position" (2) "Work area, (3) "Unit time" (4) "Hospital time" (5) "Hospital hours", (6) "Patient interaction" and (7) "transformational leadership. Unadjusted and adjusted regression coefficients and their 95% confidence intervals were reported. Variables that had $p < 0.2$ at the univariate level were entered in the multivariable regression. Two models were considered: Model I included the respondents' characteristics and the transformational leadership scores; Model II included the respondents' characteristics only. The R-squared of the two models were computed and compared. All tests were two-sided and a p-value < 0.05 was considered significant.

CHAPTER IV

RESULTS

Of the 325 surveys distributed to Registered nurses (RNs) and nurses in the administrative group, 265 surveys were returned. Five surveys were excluded from the analysis because they had responses to less than 50% of the questions. The final sample comprised 260 surveys answered, that is a response rate of 80%.

A. Respondents Characteristics

Age, gender, and level of education are not included in the HSOPS original survey, hence were not added to our version of the questionnaire for confidentiality purposes. A total of 79.5% of respondents were RNs, yet 93.5% of nurses in the whole sample reported having interaction with patients. Some units had very low response rate due to the small number of nurses, i.e. psychiatry (N=9), or to the lack of accessibility of the researcher to the nurses in special areas such as the Operating room; hence, such areas were combined with larger groups i.e., "medical surgical units". The final result was five work areas displayed in Table 1. Experiences at AUBMC and in the current area were also divided into three categories: less experienced (less than or equal to 5 years), experienced (6-10 years) and very experienced (greater than or equal to 11 years). The majority of the sample included RNs and almost half had five years of experience at AUBMC or fewer. The distribution by years of experience in the work unit is equal, and the vast majority reported working 40 hours per week or more. Valid percents were used due to some missing data on few variables. Respondents' Characteristics are summarized in Table 1.

Table 1. Clinical Characteristics of the respondents (N=260)

Characteristic	**N**	**(%)**
Nurse position		
Manager	53	(20.5%)
RN	206	(79.5%)
Work Area		
Medical surgical Units*	81	(31.2%)
Intensive care**	64	(24.6%)
Pediatrics	53	(20.4%)
Other work areas***	39	(15.0%)
Administration	23	(8.8%)
Interaction with patients		
Yes	243	(93.5%)
No	14	(5.4%)
Experience at AUBMC		
≤ 5 years	117	(45%)
6-10 years	66	(26%)
≥ 11 years	75	(29%)
Experience in current area		
≤ 5 years	150	(22%)
6-10 years	51	(20 %)
≥ 11 years	57	(22%)
Working Hours per week		
<39 hours	13	(5%)
≥ 40 hours	246	(95%)

*Medical surgical: Medical surgical units, obstetrics, psychiatry, operating room and recovery.
**Intensive care: Intensive care units, Respiratory care unit, and Emergency unit.
***Other work areas: (Mainly outpatient areas) Pre admission Unit (PAU), Clinics, Dialysis, Out Patient Department OPD, Multiple Sclerosis, Cardiac lab, and Infirmary.

B. Patient Safety: AUBMC vs. AHRQ 2011

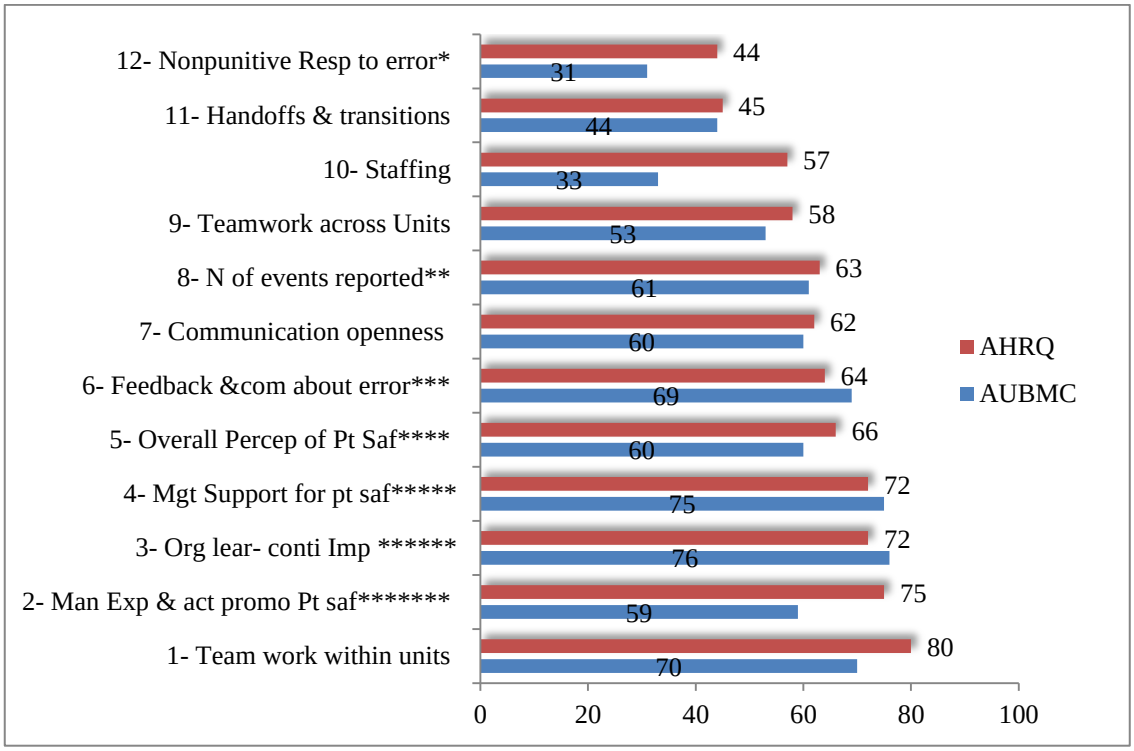
1. Patient Safety Composite-Level AUBMC vs. AHRQ 2011

On average, AUBMC scores were 57.6% positive that is lower than those of the AHRQ (63.2%). Nine composites out of twelve had lower scores than AHRQ; however, the independent-samples *t* test comparing the twelve scores showed no significant differences between the two sets (p=0.311). Scores of the composites on *Organizational learning* (76% vs. 72% AHRQ), *Management support for patient safety*

(75% vs. 72% AHRQ) and *Feedback and communication about error* (69% vs. 64% AHRQ) were higher than the corresponding ones in the AHRQ database. The lowest positively rated composites were the *non-punitive response to error* (31% vs. 44% AHRQ) and the *staffing* (33% vs. 57% AHRQ). High positive scores were also noticed for *teamwork within units* (70%), followed by *number of events reported* (61%).The other five composites ranged between 44 and 60%. The twelve composites and their respective comparative numbers in the AHRQ database are summarized in Table 2 and Figure 2.

Table 2. Composite-Level AUBMC vs. AHRQ 2011 comparative Database

Composites	% positive scores AUBMC	% positive scores AHRQ
1- Team work within units	70	80
2- Supervisor/Manager Expectations and actions promoting Patient safety	59	75
3- Organizational learning- continuous Improvement	76	72
4- Management Support for patient safety	75	72
5- Overall Perceptions of Patient Safety	60	66
6- Feedback and communication about error	69	64
7- Communication openness	60	62
8- Number of events reported	61	63
9- Teamwork across Units	53	58
10- Staffing	33	57
11- Handoffs and transitions	44	45
12- Non punitive Response to error	31	44
Average positive responses	**57.6**	**63.2**



*********** Man Exp and act promo Pt saf**:** Supervisor/Manager Expectations and actions promoting Patient safety
****** Org lear- conti Imp **:** Organizational learning- continuous Improvement.
***** Mgt Support for pt saf: Management Support for patient safety
**** Overall Percep of Pt Saf: Overall Perceptions of Patient Safety
*** Feedback andcom about error: Feedback and communication about error
** N of events reported: Number of events reported
* Nonpunitive Resp to error: - Non punitive Response to error
Fig. 2. Composite-Level AUBMC vs. AHRQ 2011 Database

Considering each item alone, AUBMC respondents answered more positively than AHRQ respondents on some items. The 42 items and their comparative numbers are illustrated in Appendix V, Table. This table also shows percentage scores for all items and composites that are retrieved from the AHRQ website; they give information about the distribution of hospital scores, thus a certain percentile shows the percentage of hospitals in the database that scored at, below or greater than this specific score.

2. Reported Events

AUBMC nurses reported more events than the AHRQ database; very few of

them reported no events at all in the past 12 months, which is on the 10th percentile of responses as compared to AHRQ hospitals. The average distribution of the number of events reported in the past 12 Months AUBMC vs. what is reported in the 2011 AHRQ data are displayed in Figure 3.

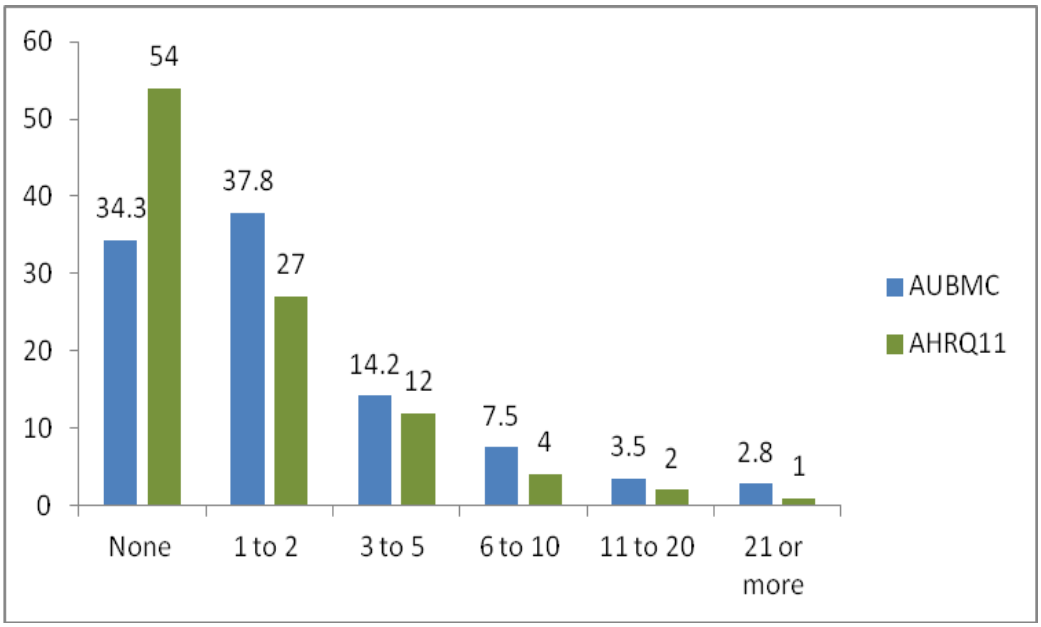


Fig. 3. Distribution of Average Number of Reported Events AUBMC (Past 12 Months) vs. AHRQ (2011)

As seen in the figure, the reporting of events is higher in this sample compared to the AHRQ database.

3. Patient Safety Grades

Only 23% of AUBMC respondents rated patient safety as excellent in the institution compared to 29% in the AHRQ database .The highest percentage of respondents rated patient safety at AUBMC as "very good" (45.2%); this is similar to AHRQ (46%) and in the 25th to 50th percentile of AHRQ hospitals. However, 29.3% of

AUBMC respondents rated the patient safety as acceptable, which is higher than AHRQ (20%), yet this is a common finding with other hospitals (90th percentile according to AHRQ website). The average distribution of patient safety grades at AUBMC vs. AHRQ 2011 is summarized in Figure 4.

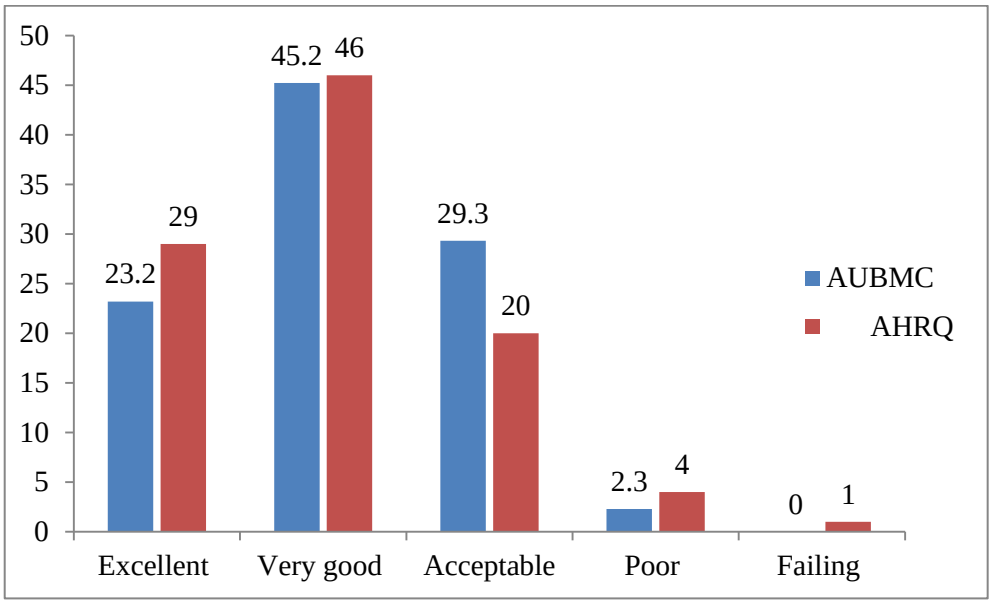


Fig. 4. Average distribution of institutional patient safety grades-(%)-AUBMC vs. AHRQ 2011

C. Comparison of Registered Nurses and Managers

1. Positive Responses of the Twelve Patient Safety Composites: Registered Nurses vs. Managers

Registered nurses (RNs) scored less positively than managers on all composites. The difference between managers and RNs on the twelve composites fluctuated between 1% and 20%. The biggest gap was on the composite *non punitive response to error*, followed by *team work within units* (17.85%) and the smallest gap was in the frequency of events reported (0.5%). The differences between the scores on the twelve composites were not found to be significant as independent samples t test

showed (*p=0.062*). Table 3 illustrates positive responses on the twelve patient safety composites.

Table 3. Positive responses of the twelve patient safety composites between RNs and Managers

Patient safety composites	RN (% positive scores)	Manager (% positive scores)
1- Team work within units	66.5	84.3
2- Supervisor/Manager expectations and actions promoting Patient safety	57.1	69.2
3- Organizational learning- continuous improvement	74.3	84.2
4- Management Support for patient safety	47.3	57.8
5- Overall perceptions of patient safety	53.9	65.3
6- Feedback and communication about error	67.8	78.1
7- Communication openness	56.5	72.5
8- Frequency of events reported	61.4	61.9
9- Teamwork across Units	50.3	63.2
10- Staffing.	30.4	40.1
11- Handoffs and transitions	42.8	49.7
12- Non punitive response to error	26.7	47.0

2. Patient Safety Grades (RNs vs. Managers)

Patient safety grades varied between RNs and Managers but not consistently. For instance, the proportion of those who rated patient safety as "excellent" was similar in both groups (23.3% for RNs vs. 23% for managers). On the other hand, RNs rated the patient safety as "very good" less frequently than the managers (44.7% vs. 48%). The gaps between RNs and managers were not large and varied between 1% and 4%. Those differences between the two groups were not significant based on the Chi square test (*p=0.654).* Interestingly none of the managers rated patient safety as poor compared to 2.9% of nurses. Patient safety grades distribution between RN and Managers are displayed in Figure 5.

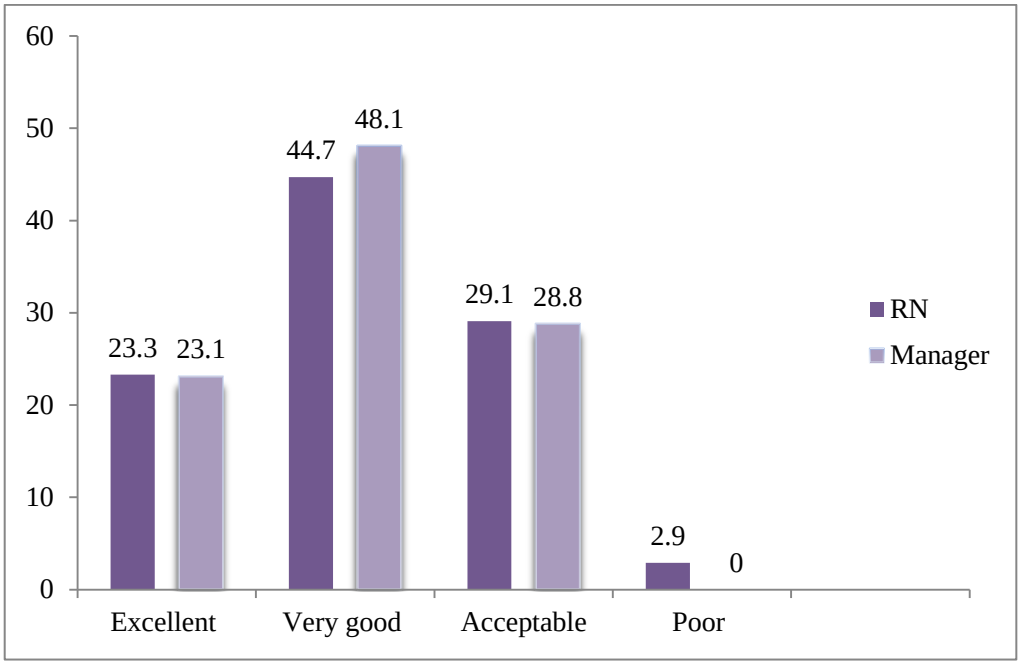


Fig. 5. Average distribution of patient safety grades-(%)-RN vs. Manager

3. Events Reported (RNs vs. Managers)

The number of events reported varied between RNs and Managers but not in a consistent way. For instance, fewer RNs reported 6 to 10 events (3.9% vs. 22% managers), while more RNs reported one to two events (40.9% vs. 24% managers). Significant differences in the frequency of reporting were noted between RNs and Managers as Chi square was computed *(p=0.000).* The distribution of the number of events reported between RNs and Managers are summarized in Figure 6.

4. Positive Responses on the Transformational Leadership Items: Registered Nurses vs. Managers

Nurses from both groups rated transformational leadership of their direct manager/supervisor positively, with managers being more positive on average (66.4 % for RNs and 74.1% for managers). Mann Whitney U computed for the average responses of both groups showed significant results (p=0.025). Chi square test

computed showed significant difference in the item where respondents were asked if their manager recognizes them; RNs were less positive than managers. Table 4 illustrates average positive answers of the seven transformational leadership items between RNs and Managers.

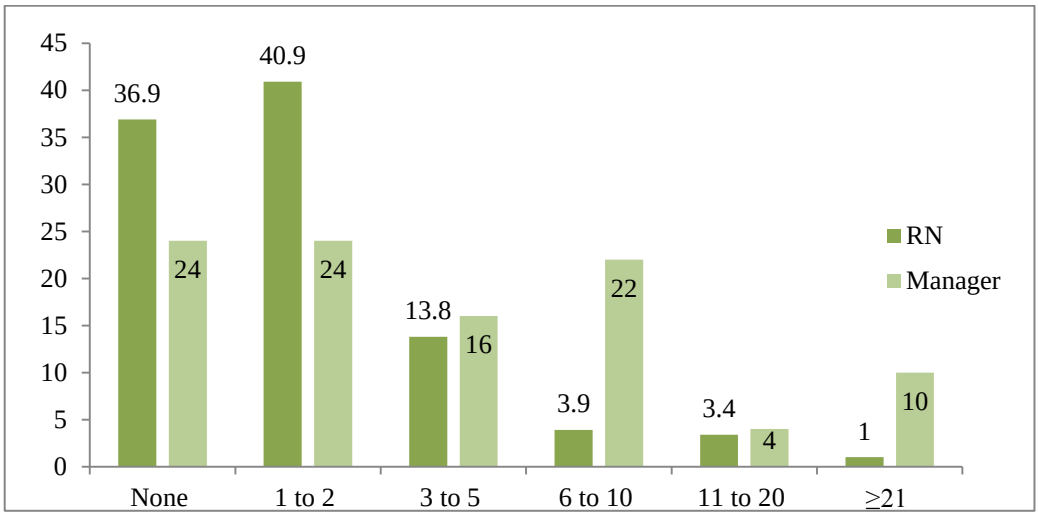


Fig. 6. Average distribution of number of events in the past 12 months RN vs. Manager

Table 4. Average Positive answers of the seven transformational leadership items RN vs. Manager

Transformational leadership items	RN(% positive scores)	Manager(% positive scores)	χ^2 test
B5- Manager communicates a clear positive vision of the future	67.3	72	0.524
B6- Manager treats staff as individuals, support/encourages their development	69.3	80.4	0.115
B7- Manager gives encouragement and recognition to staff	63.9	80.4	0.025
B8- Manager fosters trust, involvement and cooperation among team members	62.9	76.5	0.068
B9- Manager encourages thinking about problems in new ways	64.7	74.5	0.184
B10- Manager is clear about values and practices that she/he preaches	71.1	72.5	0.835
B11-Manager instills pride and respect and inspiration by being very competent	65.5	62.7	0.711
Mann Whitney U test comparing RN and manager average positive scores of transformational leadership items	*P= 0.025*		

D. Linear Regression Analyses of Total Scores of Twelve Patient Safety Composites

Linear regression was carried out to find the association between the dependent variable "total score" and the set of independent variables. Unadjusted and adjusted associations were examined.

1. Unadjusted Analysis

At the univariate level, the variables nurses' position, years of experience at both hospital and unit level, and clinical work areas such as pediatrics, medical surgical and intensive care areas were found to be significantly and negatively associated with the total scores. As for the transformational leadership, it was found to be significantly and positively associated with the outcome, hence a possible predictor of total patient safety scores. Results from the simple linear regression are shown in Table 5.

Table 5. Univariate Linear Regression. Dependent Variable: total scores of twelve patient safety composites

Variables	β	Significance ($p< 0.05$)	95% CI
1) Nurse's position			
Manager vs. RN	-8.288	0.006	(-14.228, -2.348)
2) Work area			
Other work areas* vs. pediatrics	-14.959	0.000	(-22.484, -7.435)
Other work areas vs. intensive care**	-10.804	0.004	(-18.058, -3.550)
Other work areas vs. medical surgical units***	-10.004	0.005	(-17.010, -2.998)
Other work areas vs. administration	-7.943	0.137	(-18.435, 2.549)
3) Hospital time AUBMC			
≥11 years vs. ≤5 years	-9.298	0.001	(-14.804, -3.792)
≥11 years vs. 6- 10 years	-6.772	0.034	(-13.012, -0.532)

"Table 5- *Continued*"

Variables	β	Significance (*p< 0.05*)	95% CI
4) Unit time			
≥11 years vs. ≤5 years	-8.146	0.006	(-13.894, -2.398)
≥11 y vs. 6- 10 years	-9.888	0.007	(-16.997, -2.778)
5) Hours per week			
≥ 40 hours vs.-39 hours	1.509	0.784	(-9.312, 12.330)
6) Interaction with patient			
Yes vs. no interaction	-4.355	0.496	(-16.945, 8.236)
7) Transformational leadership	1.900	0.000	(1.574, 2.225)

*Other work areas: (Mainly outpatient areas) Pre admission Unit (PAU) , Clinics, Dialysis, Out Patient Department OPD, Multiple Sclerosis, Cardiac lab, and Infirmary
**Intensive care: Intensive care units, Respiratory care unit, and Emergency unit.
***Medical surgical: Medical surgical units, obstetrics, psychiatry, operating room and recovery.

2. Adjusted Analysis

Variables that were significant at $p < 0.2$ at the univariate level were entered in two multivariable regression models. Model one included four independent variables excluding transformational leadership composite and model two included five independent variables (Table 6). In the adjusted analyses, association between work area and total score remained significant; nurses in the pediatric units had lower mean safety composites' scores than those in "other units" in both models (β =-13.751, p = 0.001 and β =-10.246, p = 0.002 respectively). In model I, lower mean scores were also observed in intensive care units and surgical units compared to "other units" (p=0.003); intensive care and medical surgical units had significant negative association with the outcome only when computed without the transformational leadership (model1). The transformational leadership composite was found to have positive significant association with the total safety score (β = 1.825, p=0.000).

Table 6. Multivariable Linear Regression predicting patient safety. Model 1-: without Transformational leadership and Model 2-:with Transformational leadership

Variables	Model 1		Model2	
	Adjusted β	95% CI and significant results(p<0.05)	Adjusted β	95% CI and significant results(p≤0.05)
1) Nurse's position Manager vs. RN	-6.532	(-14.460, 1.396)	-4.347	(-10.696, 2.002)
2) Work area				
Other work areas vs. pediatrics	-13.751	(-21.740, -5.762) P=0.001	-10.246	(-16.662, -3.830) P=0.002
Other work areas vs. intensive care	-8.597	(-16.370, -0.823) P=0.030	-6.124	(-12.353, 0.105)
Other work areas vs. medical surgical units	-8.278	(-15.709,-0.846) P=0.029	-5.240	(-11.204, 0.725)
Other work areas vs. administration	-12.566	(-25.029, -0.103) P=0.048	-9.845	(-19.818, 0.129)
3) Hospital time AUBMC				
≥11 years vs. ≤5 years	-3.778	(-14.587, 7.031)	-6.558	(-15.212, 2.096)
≥11 y vs. 6- 10 years	-0.765	(-11.319, 9.788)	-1.739	(-10.176, 6.699)
4) Unit time				
≥11 years vs. ≤5 years	-3.395	(-14.157, 7.367)	0.872	(-7.763, 9.507)
≥11 y vs. 6- 10 years	-6.242	(-17.716, 5.233)	-1.119	(-10.336, 8.097)
5) Transformational leadership	-	-	1.825	(1.501, 2.148) P=0.000
R-square	0.124		0.443	

Thus, for model I the significant predictors of patient safety perceptions were the variables related to the work area, whereas in model II predictors included working in pediatrics and the transformational leadership score. Model II explained 44% of the variation in the total scores whereas model I explained only 12% of the total variation. Thus model II, including the transformational leadership composite was a much better fit of the data.

To examine whether the effect of the transformational leadership scores on the total scores differs between RN's and manager we included in model II the interaction between the variables "nurse's position and "transformational leadership". The

interaction term was not significant (p=0.818, R-square 0.44), (results not shown). Therefore it appears that the association between patient safety and transformational leadership is the same for RN's and managers.

E. Section H Comments

The following are subjective comments contributed by few respondents (N=22) and organized in categories relevant to safety.

1. Praise

Medicine/Surgery: "AUBMC hospital units are excellent in safety management and prevention of errors and adverse events".

Pediatrics: "Not all Adverse Drug Events are discussed with staff; but patient safety is of the highest quality in this hospital, especially on our units."

Administration: "Patient safety is a top priority in our unit and in the hospital all events that occur including near misses are reported in a blame free environment".

2. Staffing

Medicine/Surgery: "Poor staffing leads to shortcuts sometimes." (original emphasis)

Pediatrics: patient safety will be reached with good staffing that leads to patient satisfaction and RN satisfaction and better outcomes; 1 to 1 ratio increases safety in ICUs."

Pediatrics: "Our unit provides good safety for patients but the high census causes some breaches in safety requirements due to the overwhelming number of procedures and high acuity**.**"

Administration: "May be staff shortage and overload have a say in errors and safety. RNs coming from not well known institutions and universities are affecting the quality of care negatively."

3. Leadership

Administration: "The administration talks about respect and transparency, I don't see either."

Administration: "Things are taking too much time to be changed/ improved even when related to patient safety. More support is needed to implement action plans that would improve patient safety."

Administration: "Although systems and policies are being updated/ adjusted to promote patient safety, the basis of these systems is out-dated and not safe. Workload is increasing and requirements of staff; this makes staff non-compliant with changes. Too much change is being introduced too quickly."

Pediatrics: "Authorities never discuss decisions, which are taken suddenly based on evidence unknown to staff. The only concern is about the patient. Staff confidence and willingness to implement change are ignored. The authorities never bother to find out whether their plans are suitable for implementation. This is a very problematic issue."

Pediatrics: "Confidentiality of reported events is breached, which feeds rumor and promotes gossip. The principle of a non-punitive approach is known in theory but not often applied in practice. Reporting of event is subjective and a tool for fostering negative judgments between workers."

Administration: "Errors that happen are not always preventable. We, as a team, try our best to achieve 100% safe practice. We would like to see no labeling of persons

and hospital units when events occur. We like to correct errors and aim not to have sentinel events."

Obstetrics: “Whenever a deadline or a crisis exists, the administrative and senior practitioners pile too many new demands on nurses who are already emotionally and professionally exhausted. There is no true recognition. Thank you emails are not useful anymore!!'

Operating Room and Recovery: "RNs should have more knowledge about patient safety to provide better quality care. In parallel, the hospital should invest in patient safety by helping RNs give better care by providing extra tips. More effort needs to be made to appreciate nurses more while understanding their needs. Hospital administration should invest more in helping RNs to improve and provide more staff for better quality of care."

Other work areas:" This is not a blame free environment. Everyone has her or his definition of what a blame free environment is."

4. Clinical Records

Psychiatry: "A simple filing issue has not been resolved in a year as far as I know. Files are lost and misplaced. Patients attend consultations with physicians, but their files are not available. Delays occur in replying to patients’ messages for the same reason.”

5. Space

Medicine/Surgery: Electric plugs for Baxters and data scopes should be put at a reasonable height and not behind doors because this equipment is making it difficult to access patients’ rooms."

Pediatrics: Spaces are narrow in my unit and this is putting patient and the staff safety on the line. Staffs do not have enough space to work easily during patient transfers and when doing procedures outside the unit. Thus, the risk to patient and staff safety."

6. Use of Equipment

Pediatrics: One respondent drew a picture of a big baby put unsafely in a warmer.

Other work areas: "Patient safety is a high priority in our institution; however, fostering a blame free environment would help RNs report patient safety issues and work together for solutions."

7. Security

Obstetrics: "I have a comment about visiting hours usually in my Unit. Security asks for permission for visitors when visiting hours are over. We always argue with him and tell him his job is to forbid people from visiting outside visiting hours and not to put the responsibility on staff."

CHAPTER V

DISCUSSION

This study's response rate was 80%, high considering response rates of other surveys of nurses at AUBMC. There may be at least two reasons for the high response rate: the nurses might have been particularly interested in safety culture because they recently prepared for Magnet re-designation, and at the time of the survey they were involved in JCI re-accreditation. Another important influence may have been the comprehensive recruitment strategy used by the investigator, who is a senior RN and well known to the AUBMC nurses. The nurses may have been less willing to take part in the survey if it had been conducted by someone less well known to them.

The findings of the study cannot be directly compared with those reported in the literature because the study instruments have not been used in the same combination before. Therefore, rather than supporting or contradicting the findings of previous studies, the value of the present study lies in encouraging other investigators to examine the relationship between perceptions of safety culture and transformational leadership among RNs and nurses in management positions.

A. Analysis of the Results

1. Research Question 1

The first research question addressed in this study was "Are the results for AUBMC nurses comparable to the 2011 US hospitals 'AHRQ database? Responses from AUBMC scores on the HSOPS were close to but less positive than those in the AHRQ database. There were however, clear differences on some items. Only one third

of nurses in the AUBMC sample (31%) answered positively to the '*non punitive response to error'* item, which indicates that the safety culture at AUBMC has not moved beyond blame and punishment. Such findings contradict the "just culture" concept espoused by AUBMC, which focuses on managing system problems rather than blaming individuals; at least the nurses do not perceive a just culture to be the norm. The 33% positive response rate to the staffing dimension is another finding that needs to be addressed by AUBMC, because optimum patient care cannot be provided for patients when staffing levels are perceived to be inadequate. The importance of this finding is heightened because the nurses in management positions as well as RN's indicated that more nursing hours are required to meet patient needs. Furthermore, a problem with staffing levels was mentioned in responses to the open ended questions. Moreover, the AUBMC staffing composite was lower than that reported from other studies: Chen and Li in 2010 (37%); Mohammadreza *et al.* in 2010 (38.1%); and in a Chinese study by Nie *et al.* in 2013 (45%).

The number of events reported by the AUBMC respondents indicates that the organization has a safety culture of that encourages bringing errors to the attention of others rather than hiding them. The low score of the *non-punitive response to error* is similar to that reported by Mohammadreza *et al.* 2010 (22.8% vs. 43%). However, the composites that received high scores in this study also returned high scores in other studies e.g. the response to the *Organizational learning continuous improvement* item (88%) and the *teamwork within units* s (84%) were consistent with the findings reported by Nie *et al.* (2013).The findings reported pave the way for quality improvement efforts at AUBMC that should start with the reevaluation of staffing levels. Doing more to foster a real blame free environment is another important area that requires significant attention from senior AUBMC administrators.

2. Research Question 2

The second research question was "Are there significant differences between RNs' perceptions of safety culture and those of the nurses in the management group?" Notably, Registered nurses were less positive than managers in their ratings on all HSOPS composites. The biggest gap between the two groups of nurses was on the composite *non punitive response to error* (20.3%), followed by *team work within units* (17.8%). A wide gap was also observed in the *communication openness* composite, which indicates a that RNs at AUBMC do not feel comfortable to question higher authority and, therefore lack the freedom to speak up when they see something wrong with patient safety. These differences in perception require more investigation.

Discrepancies between RNs and nurses in management positions on the twelve composites indicate the deeper pessimism of front line nurses. It is not easy to know what might have accounted for those results. On average, managers demonstrated more knowledge about the number of events reported; such differences could be attributed to the differences in leadership on certain areas and the way they tackle events happening in terms of staff awareness about events, and the way managers deal with staff upon such occurrence.

The AUBMC findings support those of Hannah *et al*. (2008). In their study, nurses also rated patient safety culture less positively than the administrative group. However, the gap between the two groups in the Hannah *et al.* study was less than that at AUBMC for the *non-punitive response to error* item, although these authors reported the gap they found as high. The larger gap found at AUBMC warrants further investigation.

3. Research Question 3

The third research question was "Do participants who have higher perceptions of transformational leadership also rate AUBMC's safety culture more positively, and does this differ among RNs and nurses in administrative positions?"

When asked about their manager in section B, that includes both safety and transformational leadership items, respondents' positive responses for the safety items had an average of 59.4%. Those of transformational leadership were even higher, with an average of 67.7%. Managers' average positive responses on transformational leadership items were found to be significantly more positive than those of the RNs, especially for perceptions of manager recognition. The managers had significantly higher positive responses compared to the RNs, another finding that requires further investigation.

The regression analysis in its two models supported the third research question: model II which included the transformational leadership composite was a much better fit for the data and explained 44% of the variation in the total scores, whereas model I explained only 12% of the variance. That transformational leadership was found to predict positive perceptions of patient safety culture is a promising finding, which further supports the importance of the AUBMC findings.

As for the other variables, the change in significance between the two models, and especially the non-significance noted between nurses' position and safety items at the multivariable level, justifies the need for future research on larger samples and different institutions. Furthermore, 56% of the variance in model II remains unexplained.

Concerning the subjective comments in section H of the survey, the majority addressed the leadership approach to patient safety at AUBMC. Shortage of staffing

"was another theme commented on negatively addressed by respondents working in different areas of the organization", which corroborates the quantitative findings.

McFadden, Henagan and Gowen in 2009 were able to support their hypothesis that the adoption of a transformational leadership at high administrative levels supports a safety chain that leads to safe outcomes for patients. Such findings reveal the importance of strengthening transformational leadership at the administrative level, thus improving patient safety culture. Action is required in this respect at AUBMC.

The findings suggest that AUBMC fits the third level *"calculative*" description of Hudson and van der Graaf (2002): the staff admits the existence of systems managing safety, but action is procedural, serving only regulations and the system. AUBMC is therefore at a level between a generative and a pathological culture, a finding that again suggests the need for senior administrative action. Using Ekenedo's framework as a guide, further efforts by senior administration could, if implemented comprehensively, move AUBMC to the higher *proactive culture* level, with good prospects for moving the organization to the even higher *generative* level. Although it was not one of the aims of this study, disseminating its results could pave the way towards improving the patient safety culture at AUBMC.

B. Limitations

The study has a number of important limitations: it was conducted on a convenience sample of RNs and nurse managers; the results may not be representative of the AUBMC nursing workforce; the cross sectional design precludes analysis of how nurses' perceptions of safety culture change over time. Furthermore, the survey was administered in English, which is the second language of the participants, without prior examination of cultural relevance; differences in health care delivery systems in the US

and in Lebanon may have also affected the validity of HSOPS items. Furthermore, the examination of validity that was conducted was limited to exploring face validity. More studies are needed to establish the concurrent, convergent, cultural and predictive validity of the HSOPS. Furthermore, the study was confined to two groups of nurses. All other health professionals and healthcare workers were excluded. The results of this study such as the difference between the nurses and the administrative group's perceptions of transformational leadership and safety are present but we could not know what might account for the differences reported. The same can be said of the differences identified between AUBMC results on values in the AHRQ database. The Cronbach alpha for the study instrument was an acceptable 0.897, but as mentioned, more work is needed to establish the validity of the instrument in English and in translation for further use in Lebanon.

C. Implications

The findings of this study show evidence of the success of the methodology. Nurses were approached both verbally through investigator's rounds and also through the invitation sheets posted on the nurses 'stations and in the management group offices; this mixture of approaches can be used in research studies in larger samples and even at a national level. The confidentiality, anonymity of the questionnaires and the use of informed consent ensured the rights of the participants. The survey tool received no negative comments or clarifications from the respondents, as far as we knew; the high response rate (80%) and lack of unanswered questions (less than 3%) provide an idea about the acceptability of the tool by the respondents. Better outcomes would be found if those tools were properly translated into the Arabic language to check cultural suitability and psychometric testing. This translation would facilitate a national study

that would give a more complete picture of RN and managers' perceptions of patient safety culture, transformational leadership and the relationship between them in Lebanon as a whole rather than in one medical center. Further studies about transformational leadership and patient safety need to be conducted in other countries in the Eastern Mediterranean Region.

D. Recommendations

Despite Magnet re-designation and JCI accreditation, patient safety will remain a concern at AUBMC. Adopting and truly applying a transformational leadership style at high levels of a hospital administration is likely to be an important aspect of improving patient safety at the organization. AUBMC administrators should listen to staff concerns, especially pertinent to staffing, as this was the lowest scored dimension by both groups and viewing its impact on patient safety; this can be done through regular forums for frontline nurses. Managers and supervisors should be thoughtful about avoiding blame and labeling of employees when considering patient safety errors. Administrative efforts should be targeted also at the wider objective of creating a "real" blame free environment throughout the organization. In particular, the concept of a "just culture" should be promoted through education and training of staff at all levels of AUBMC. Furthermore, RNs should be more involved in error prevention and quality improvement. Training in transformational leadership should also be fostered through extensive training of front line staff, and especially nurses in leadership positions.

A further study is needed to explore the impact of transformational leadership on patient safety in larger samples and in more than one hospital setting. On the other hand, it is recommended to repeat this survey yearly at AUBMC in coordination with the hospital administration.

CHAPTERVI

CONCLUSION

Overall the HSOPSC results for AUBMC were similar to those for hospitals in the AHRQ database with few statistically significant differences. Furthermore, the results for AUBMC were in agreement with those reported in the literature. Overall the HSOPSC results for AUBMC were similar to those for hospitals in the AHRQ database with few statistically significant differences. Furthermore, the results for AUBMC were in agreement with those reported in the literature. Importantly, the perceptions of nurses in the management group ' were generally more positive than those of the RNs, which may suggest that nurses in the management group have inadequate information about patient safety- related problems that arise in day-to-day practice. However the differences identified in the results section are for the most part trends rather than statistically significant differences. The positive association between transformational leadership scores and the patient safety composites is an important finding that indicates that leadership style is an important predictor of perceptions of safety culture, even when the effect of confounding variables is controlled. The positive association between these variables cannot demonstrate causation. Therefore, additional studies are required. However the association reported implies that developing leadership competencies among nurses at all levels of the organization may be essential for further development of the safety culture. In brief, this study gave a clear if static picture of nurses' perceptions of the current patient safety culture at AUBMC. The strengths and weaknesses identified reveal the need for senior management and staff initiatives aimed at sustaining and further improving patient safety culture at the institution. Finally, the

study findings suggest the need for similar studies of safety cultures in Lebanese hospitals. Studies of hospitals of different sizes, in different geographical, with different nurse workforce characteristics, are a high priority for further research.

APPENDIX I

HOSPITAL SURVEY ON PATIENT SAFETY CULTURE (MODIFIED)

Instructions

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital and will take about 10 to 15 minutes to complete.

If you do not wish to answer a question, or if a question does not apply to you, you may leave your answer blank.

- *An **"event"** is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.*
- ***"Patient safety"** is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.*

BACKGROUND Complete Part 1 OR Part 2 AND Part 3

Part 1: To be completed by registered nurses working in direct patient care

In this survey, think of your "unit" as the clinical area of the hospital where you spend *most* of your work time or provide *most* of your clinical services.

What is your primary work area or unit in this hospital? Select ONE answer.

☐ a. Many different hospital units/No specific unit

☐ b. Medicine (non-surgical)
☐ c. Surgery
☐ d. Obstetrics
☐ e. Pediatrics
☐ f. Emergency department
☐ g. Intensive care unit (any type)
☐ h. Psychiatry/mental health
☐ i. Rehabilitation
☐ j. Pharmacy
☐ k. Laboratory
☐ l. Radiology
☐ m. Anesthesiology

Part 2: To be completed by nurses in management and leadership roles

Please select this box if you work in any of the following roles: ☐

Nurse Manager; Assistant Nurse Manager; Clinical Educators; Clinical Nurse Specialists; Nurse Quality Manager, Nurse Clinical Leader; Executive Assistant; Magnet Coordinator; Case Manager; Life Support Coordinator; Nurse Shift Administrator, other leadership or management role

Part 3: To be completed by all participants

P3.1 In your staff position, do you typically have direct interaction or contact with patients?

☐ a. YES, I typically have direct interaction or contact with patients.

☐ b. NO, I typically do NOT have direct interaction or contact with patients.

P3.2 How long have you worked in nursing?

- ☐ a. Less than 1 year
- ☐ b. 1 to 5 years
- ☐ c. 6 to 10 years
- ☐ d. 11 to 15 years
- ☐ e. 16 to 20 years
- ☐ f. 21 years or more

P3.3 How long have you worked in this <u>hospital</u>?

- ☐ a. Less than 1 year
- ☐ b. 1 to 5 years
- ☐ c. 6 to 10 years
- ☐ d. 11 to 15 years
- ☐ e. 16 to 20 years
- ☐ f. 21 years or more

P.3.4 How long have you worked in your current hospital <u>work area/unit/role</u>?

- ☐ a. Less than 1 year
- ☐ b. 1 to 5 years
- ☐ c. 6 to 10 years
- ☐ d. 11 to 15 years
- ☐ e. 16 to 20 years
- ☐ f. 21 years or more

P3.5 Typically, how many <u>hours per week</u> do you work in this hospital?

- ☐ a. Less than 20 hours per week
- ☐ b. 20 to 39 hours per week
- ☐ c. 40 to 59 hours per week
- ☐ d. 60 to 79 hours per week
- ☐ e. 80 to 99 hours per week
- ☐ f. 100 hours per week or more

SECTION A: Your Work Area/Unit.

Please indicate your agreement or disagreement with the following statements about your work area/unit.

Think about your hospital work area/unit…	**Strongly Disagree** ▼	**Disagree** ▼	**Neither** ▼	**Agree** ▼	**Strongly Agree** ▼
1. People support one another in this unit	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
2. We have enough staff to handle the workload	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
3. When a lot of work needs to be done quickly, we work together as a team to get the work done	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
4. In this unit, people treat each other with respect	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
5. Staff in this unit work longer hours than is best for patient care	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
6. We are actively doing things to improve patient safety	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
7. We use more agency/temporary staff than is best for patient care	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5
8. Staff feel like their mistakes are held against them	☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

9. Mistakes have led to positive changes here	☐1	☐2	☐3	☐4	☐5
10. It is just by chance that more serious mistakes don't happen around here	☐1	☐2	☐3	☐4	☐5
11. When one area in this unit gets really busy, others help out ..	☐1	☐2	☐3	☐4	☐5
12. When an event is reported, it feels like the person is being written up, not the problem	☐1	☐2	☐3	☐4	☐5
13. After we make changes to improve patient safety, we evaluate their effectiveness	☐1	☐2	☐3	☐4	☐5
14. We work in "crisis mode" trying to do too much, too quickly	☐1	☐2	☐3	☐4	☐5
15. Patient safety is never sacrificed to get more work done	☐1	☐2	☐3	☐4	☐5
16. Staff worry that mistakes they make are kept in their personnel file.....	☐1	☐2	☐3	☐4	☐5
17. We have patient safety problems in this unit	☐1	☐2	☐3	☐4	☐5
18. Our procedures and systems are good at preventing errors from happening	☐1	☐2	☐3	☐4	☐5

SECTION B: Your Supervisor/Manager

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report.

	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	☐1	☐2	☐3	☐4	☐5
2. My supervisor/manager seriously considers staff suggestions for improving patient safety	☐1	☐2	☐3	☐4	☐5
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	☐1	☐2	☐3	☐4	☐5
4. My supervisor/manager overlooks patient safety problems that happen over and over	☐1	☐2	☐3	☐4	☐5
5. My supervisor/manager communicates a clear and positive vision of the future	☐1	☐2	☐3	☐4	☐5
6. My supervisor/manager treats staff as individuals, supports and encourages their development.....	☐1	☐2	☐3	☐4	☐5
7. My supervisor/manager gives encouragement and recognition to staff	☐1	☐2	☐3	☐4	☐5
8. My supervisor/manager fosters trust, involvement and cooperation among team members.....	☐1	☐2	☐3	☐4	☐5

9. My supervisor/manager encourages thinking about problems in new ways and questions assumptions	☐1	☐2	☐3	☐4	☐5
10. My supervisor/manager is clear about his/her values and practises what he/she preaches	☐1	☐2	☐3	☐4	☐5
11. My supervisor/manager instills pride and respect in others and inspires me by being highly competent	☐1	☐2	☐3	☐4	☐5

SECTION C: Communications

How often do the following things happen in your work area/unit?

Think about your hospital work area/unit…	**Never** ▼	**Rarely** ▼	**Some-times** ▼	**Most of the time** ▼	**Always** ▼
1. We are given feedback about changes put into place based on event reports	☐1	☐2	☐3	☐4	☐5
2. Staff will freely speak up if they see something that may negatively affect patient care	☐1	☐2	☐3	☐4	☐5
3. We are informed about errors that happen in this unit	☐1	☐2	☐3	☐4	☐5
4. Staff feel free to question the decisions or actions of those with more authority	☐1	☐2	☐3	☐4	☐5
5. In this unit, we discuss ways to prevent errors from happening again	☐1	☐2	☐3	☐4	☐5
6. Staff are afraid to ask questions when something does not seem right	☐1	☐2	☐3	☐4	☐5

SECTION D: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, *how often are they reported?*

	Never ▼	**Rarely** ▼	**Some-times** ▼	**Most of the time** ▼	**Always** ▼
1. When a mistake is made, but is *caught and corrected before affecting the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
2. When a mistake is made, but has *no potential to harm the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
3. When a mistake is made that *could harm the patient*, but does not, how often is this reported?	☐1	☐2	☐3	☐4	☐5

SECTION E: Patient Safety Grade

Please give your work area/unit in this hospital an overall grade on patient safety.

☐	☐	☐	☐	☐
A Excellent	**B** Very Good	**C** Acceptable	**D** Poor	**E** Failing

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospital.

Think about your hospital…	**Strongly Disagree** ▼	**Disagree** ▼	**Neither** ▼	**Agree** ▼	**Strongly Agree** ▼
1. Hospital management provides a work climate that promotes patient safety	☐1	☐2	☐3	☐4	☐5
2. Hospital units do not coordinate well with each other	☐1	☐2	☐3	☐4	☐5
3. Things "fall between the cracks" when transferring patients from one unit to another	☐1	☐2	☐3	☐4	☐5
4. There is good cooperation among hospital units that need to work together	☐1	☐2	☐3	☐4	☐5
5. Important patient care information is often lost during shift changes	☐1	☐2	☐3	☐4	☐5
6. It is often unpleasant to work with staff from other hospital units	☐1	☐2	☐3	☐4	☐5
7. Problems often occur in the exchange of information across hospital units	☐1	☐2	☐3	☐4	☐5
8. The actions of hospital management show that patient safety is a top priority	☐1	☐2	☐3	☐4	☐5
9. Hospital management seems interested in patient safety only after an adverse event happens	☐1	☐2	☐3	☐4	☐5
10. Hospital units work well together to provide the best care for patients	☐1	☐2	☐3	☐4	☐5
11. Shift changes are problematic for patients in this hospital	☐1	☐2	☐3	☐4	☐5

SECTION G: Number of Events Reported

In the past 12 months, how many event reports have you filled out and submitted?

- ☐ a. No event reports
- ☐ b. 1 to 2 event reports
- ☐ c. 3 to 5 event reports
- ☐ d. 6 to 10 event reports
- ☐ e. 11 to 20 event reports
- ☐ f. 21 event reports or more

SECTION H: Your Comments

Please feel free to write any comments about patient safety, error, or event reporting in your hospital.

THANK YOU FOR COMPLETING THIS SURVEY.

Please do not put your name or any other personal identifier on the questionnaire

APPENDIX II

HOSPITAL SURVEY ON PATIENT SAFETY CULTURE (ORIGINAL)

Instructions

This survey asks for your opinions about patient safety issues, medical error, and event reporting in your hospital and will take about 10 to 15 minutes to complete.

If you do not wish to answer a question, or if a question does not apply to you, you may leave your answer blank.

- *An **"event"** is defined as any type of error, mistake, incident, accident, or deviation, regardless of whether or not it results in patient harm.*
- ***"Patient safety"** is defined as the avoidance and prevention of patient injuries or adverse events resulting from the processes of health care delivery.*

SECTION A: Your Work Area/Unit

In this survey, think of your "unit" as the work area, department, or clinical area of the hospital where you spend *most* of your work time or provide *most* of your clinical services.

What is your primary work area or unit in this hospital? Select ONE answer.

☐ a. Many different hospital units/No specific unit
☐ b. Medicine (non-surgical)
☐ c. Surgery
☐ d. Obstetrics
☐ e. Pediatrics
☐ f. Emergency department
☐ g. Intensive care unit (any type)
☐ h. Psychiatry/mental health
☐ i. Rehabilitation
☐ j. Pharmacy
☐ k. Laboratory
☐ l. Radiology
☐ m. Anesthesiology
☐ n. Other, please specify:

Please indicate your agreement or disagreement with the following statements about your work area/unit.

Think about your hospital work area/unit…	**Strongly Disagree** ▼	**Disagree** ▼	**Neither** ▼	**Agree** ▼	**Strongly Agree** ▼
1. People support one another in this unit	☐1	☐2	☐3	☐4	☐5
2. We have enough staff to handle the workload	☐1	☐2	☐3	☐4	☐5
3. When a lot of work needs to be done quickly, we work together as a team to get the work done	☐1	☐2	☐3	☐4	☐5
4. In this unit, people treat each other with respect	☐1	☐2	☐3	☐4	☐5
5. Staff in this unit work longer hours than is best for patient care	☐1	☐2	☐3	☐4	☐5

SECTION A: Your Work Area/Unit (continued)

Think about your hospital work area/unit…	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
6. We are actively doing things to improve patient safety	☐1	☐2	☐3	☐4	☐5
7. We use more agency/temporary staff than is best for patient care	☐1	☐2	☐3	☐4	☐5
8. Staff feel like their mistakes are held against them	☐1	☐2	☐3	☐4	☐5
9. Mistakes have led to positive changes here	☐1	☐2	☐3	☐4	☐5
10. It is just by chance that more serious mistakes don't happen around here	☐1	☐2	☐3	☐4	☐5
11. When one area in this unit gets really busy, others help out	☐1	☐2	☐3	☐4	☐5
12. When an event is reported, it feels like the person is being written up, not the problem	☐1	☐2	☐3	☐4	☐5
13. After we make changes to improve patient safety, we evaluate their effectiveness	☐1	☐2	☐3	☐4	☐5
14. We work in "crisis mode" trying to do too much, too quickly	☐1	☐2	☐3	☐4	☐5
15. Patient safety is never sacrificed to get more work done	☐1	☐2	☐3	☐4	☐5
16. Staff worry that mistakes they make are kept in their personnel file	☐1	☐2	☐3	☐4	☐5
17. We have patient safety problems in this unit	☐1	☐2	☐3	☐4	☐5
18. Our procedures and systems are good at preventing errors from happening	☐1	☐2	☐3	☐4	☐5

SECTION B: Your Supervisor/Manager

Please indicate your agreement or disagreement with the following statements about your immediate supervisor/manager or person to whom you directly report.

	Strongly Disagree ▼	Disagree ▼	Neither ▼	Agree ▼	Strongly Agree ▼
1. My supervisor/manager says a good word when he/she sees a job done according to established patient safety procedures	☐1	☐2	☐3	☐4	☐5
2. My supervisor/manager seriously considers staff suggestions for improving patient safety	☐1	☐2	☐3	☐4	☐5
3. Whenever pressure builds up, my supervisor/manager wants us to work faster, even if it means taking shortcuts	☐1	☐2	☐3	☐4	☐5
4. My supervisor/manager overlooks patient safety problems that happen over and over	☐1	☐2	☐3	☐4	☐5

SECTION C: Communications

How often do the following things happen in your work area/unit?

Think about your hospital work area/unit…	**Never** ▼	**Rarely** ▼	**Some-times** ▼	**Most of the time** ▼	**Always** ▼
1. We are given feedback about changes put into place based on event reports	☐1	☐2	☐3	☐4	☐5
2. Staff will freely speak up if they see something that may negatively affect patient care	☐1	☐2	☐3	☐4	☐5
3. We are informed about errors that happen in this unit	☐1	☐2	☐3	☐4	☐5
4. Staff feel free to question the decisions or actions of those with more authority	☐1	☐2	☐3	☐4	☐5
5. In this unit, we discuss ways to prevent errors from happening again	☐1	☐2	☐3	☐4	☐5
6. Staff are afraid to ask questions when something does not seem right	☐1	☐2	☐3	☐4	☐5

SECTION D: Frequency of Events Reported

In your hospital work area/unit, when the following mistakes happen, *how often are they reported?*

	Never ▼	**Rarely** ▼	**Some-times** ▼	**Most of the time** ▼	**Always** ▼
1. When a mistake is made, but is *caught and corrected before affecting the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
2. When a mistake is made, but has *no potential to harm the patient*, how often is this reported?	☐1	☐2	☐3	☐4	☐5
3. When a mistake is made that *could harm the patient*, but does not, how often is this reported?	☐1	☐2	☐3	☐4	☐5

SECTION E: Patient Safety Grade

Please give your work area/unit in this hospital an overall grade on patient safety.

☐	☐	☐	☐	☐
A	**B**	**C**	**D**	**E**
Excellent	Very Good	Acceptable	Poor	Failing

SECTION F: Your Hospital

Please indicate your agreement or disagreement with the following statements about your hospital.

Think about your hospital…	**Strongly Disagree** ▼	**Disagree** ▼	**Neither** ▼	**Agree** ▼	**Strongly Agree** ▼
1. Hospital management provides a work climate that promotes patient safety	☐1	☐2	☐3	☐4	☐5
2. Hospital units do not coordinate well with each other	☐1	☐2	☐3	☐4	☐5
3. Things "fall between the cracks" when transferring patients from one unit to another	☐1	☐2	☐3	☐4	☐5

4. There is good cooperation among hospital units that need to work together.....	☐1	☐2	☐3	☐4	☐5

SECTION F: Your Hospital (continued)

Think about your hospital…	**Strongly Disagree ▼**	**Disagree ▼**	**Neither ▼**	**Agree ▼**	**Strongly Agree ▼**
5. Important patient care information is often lost during shift changes	☐1	☐2	☐3	☐4	☐5
6. It is often unpleasant to work with staff from other hospital units	☐1	☐2	☐3	☐4	☐5
7. Problems often occur in the exchange of information across hospital units	☐1	☐2	☐3	☐4	☐5
8. The actions of hospital management show that patient safety is a top priority.....	☐1	☐2	☐3	☐4	☐5
9. Hospital management seems interested in patient safety only after an adverse event happens	☐1	☐2	☐3	☐4	☐5
10. Hospital units work well together to provide the best care for patients	☐1	☐2	☐3	☐4	☐5
11. Shift changes are problematic for patients in this hospital.....	☐1	☐2	☐3	☐4	☐5

SECTION G: Number of Events Reported

In the past 12 months, how many event reports have you filled out and submitted?

- ☐ a. No event reports
- ☐ b. 1 to 2 event reports
- ☐ c. 3 to 5 event reports
- ☐ d. 6 to 10 event reports
- ☐ e. 11 to 20 event reports
- ☐ f. 21 event reports or more

SECTION H: Background Information

This information will help in the analysis of the survey results.

1. How long have you worked in this hospital?

- ☐ a. Less than 1 year
- ☐ b. 1 to 5 years
- ☐ c. 6 to 10 years
- ☐ d. 11 to 15 years
- ☐ e. 16 to 20 years
- ☐ f. 21 years or more

2. How long have you worked in your current hospital work area/unit?

- ☐ a. Less than 1 year
- ☐b. 1 to 5 years
- ☐ c. 6 to 10 years
- ☐ d. 11 to 15 years
- ☐ e. 16 to 20 years
- ☐ f. 21 years or more

3. Typically, how many hours per week do you work in this hospital?

- ☐a.Less than 20 hours per week
- ☐ b. 20 to 39 hours per week
- ☐c.40 to 59 hours per week
- ☐d. 60 to 79 hours per week
- ☐ e. 80 to 99 hours per week
- ☐ f. 100 hours per week or more

SECTION H: Background Information (continued)

4. What is your staff position in this hospital? Select ONE answer that best describes your staff position.

- ☐ a. Registered Nurse
- ☐ b. Physician Assistant/Nurse Practitioner
- ☐ c. LVN/LPN
- ☐ d. Patient Care Asst/Hospital Aide/Care Partner
- ☐ e. Attending/Staff Physician
- ☐ f. Resident Physician/Physician in Training
- ☐ g. Pharmacist
- ☐ h. Dietician
- ☐ i. Unit Assistant/Clerk/Secretary
- ☐ j. Respiratory Therapist
- ☐ k. Physical, Occupational, or Speech Therapist
- ☐ l. Technician (e.g., EKG, Lab, Radiology)
- ☐ m. Administration/Management
- ☐ n. Other, please specify:

5. In your staff position, do you typically have direct interaction or contact with patients?

- ☐ a. YES, I typically have direct interaction or contact with patients.
- ☐ b. NO, I typically do NOT have direct interaction or contact with patients.

6. How long have you worked in your current specialty or profession?

- ☐a.Less than 1 year
- ☐ b. 1 to 5 years
- ☐ c. 6 to 10 years
- ☐ d. 11 to 15 years
- ☐ e. 16 to 20 years
- ☐ f. 21 years or more

SECTION I: Your Comments

Please feel free to write any comments about patient safety, error, or event reporting in your hospital.

THANK YOU FOR COMPLETING THIS SURVEY.

APPENDIX III

INVITATION TO PARTICIPATE IN A RESEARCH STUDY

American University of Beirut

This is Not an Official Message from AUB

You are invited to participate in a research study entitled: 'Survey of Registered Nurses' and Nurses in Management Position's Perceptions of the Safety Culture at AUBMC conducted by Dr Michael Clinton, Dr. Samar Noureddine, and Ms Aimee Khaled (MSN student) Faculty of Medicine, Hariri School of Nursing at the American University of Beirut. The conduct of this study will adhere to the IRB approved conditions and terms.

RECRUITMENT OF PARTICIPANTS

The IRB approved method for approaching subjects is by distributing this information sheet and survey packages to clinical floors and nursing departments, including Nursing Services. The purpose of the study is to 1) describe AUBMC Registered Nurse's perceptions of patient safety culture, 2) describe nurses in administrative positions' perceptions of the patient safety culture, and 3) compare the perceptions of the two groups with one another and with norms in the AHRQ 2010 US benchmarking Data base.

PROCEDURES

This message invites you to:

1. **Read the consent form and consider whether you want to be involved in the study.**
   And to note:
   - ***Participation is completely voluntary.***
   - ***If you voluntarily agree to take part in the study, completing the questionnaire will take around 15 minutes.***
   - ***Only the data you provide in the questionnaire will be collected and analyzed.***
   - ***The results of the survey will be published as a project report available from the AUB Jafet Library.***

POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY

You will not receive payment for participation in this study.

The results of the study will provide a descriptive overview of the perceived patient safety culture at AUBMC and recommendations for its further development.

Potential risks for participating in the study

The risks of the study are minimal.

CONFIDENTIALITY

Any information that is obtained in connection with this study will remain confidential.

Only you will know that you returned a questionnaire.

PARTICIPATION AND WITHDRAWAL

You can choose whether to be in this study or not. If you volunteer to take part, you may withdraw at any time without consequences of any kind.

AGREEMENT OF THE RESEARCH SUBJECT

If after reading the consent document and having any questions you might have answered to your satisfaction, you voluntarily agree to take part in the study, please complete the study questionnaire and return it in a sealed envelope to the drop box provided on your clinical floor/in your administrative area.

Thank You!

APPENDIX IV

CONSENT DOCUMENT

American University of Beirut Medical Center
Dr M .Clinton, Dr S. Noureddine and Ms A. Khaled

We are inviting you to participate in a **research study**. Please read the information below and feel free to ask any questions that you may have.

A. Project Description

1. In this study, you will be answering a survey on patient safety culture. This survey is widely used and was developed by the Agency for Healthcare Research and Quality, you will not be asked sensitive questions, and you are free to skip any question you do not feel comfortable to answer.
2. The estimated time to complete this survey is approximately 10 to 15 minutes. If you agree to take part in the study, you will have two weeks to return your completed questionnaire.
3. The main purpose of this study is to assess AUBMC readiness for further development of its patient safety culture. More specifically, this study will: describe AUBMC Registered Nurses perceptions of patient safety culture, describe the perceptions of AUBMC nurses in administrative group on patient safety culture, and compare the perceptions of the two groups with each other and against AHRQ 2010 US benchmarking Data base. The study will also help us assess whether the survey instrument needs modification for further use in Lebanon.

B. Risks and Benefits

Your participation in this study does not involve any physical or emotional risk to you beyond the risks of daily life. **You have the right not to take part in the study**, **and to withdraw your consent or discontinue at any time for any reason. Refusing or discontinuing participation will in no way affect your relationship with AUBMC.**

You will receive no direct benefit from participating in this research study. However, your participation will help researchers to better understand the existing safety culture at AUBMC, which may lead to strategies that will improve the safety culture. The results of this research study will be posted in clinical units at the end of the study. Any amendments we make to the questionnaire will assist investigators to conduct more surveys of the patient safety culture in Lebanese medical centers and hospitals.

C. Privacy and Confidentiality

This survey is anonymous. **We not collect any information that could identify you**. All completed questionnaires will be kept in a locked drawer in a locker room and will be analyzed on a password protected computer kept in a secure office in HSON. Data access is limited to the Principal Investigator and researchers working directly on this project. All data will be destroyed responsibly after the required retention period of three years. Your privacy will be maintained in all published and written accounts of the study. As the study is anonymous, your name cannot be mentioned or used in our reports or published papers. You do not even need to sign this consent document, because it is attached to the survey. Returning a completed questionnaire confirms your consent to take part in our study.

D. Contact Information

1) If you have any questions or concerns about the research you may contact: Aimee khaled, email: ak39@aub.edu.lb, telephone: 01/350000, extension: 6921 or Dr M.Clinton at Hariri School of Nursing(01-350000, extension:5956) email: mc42@aub.edu.lb.
2) If you have any questions, concerns or complains about your rights as a participant in this research, you can contact AUB: Social and Behavioral Sciences Institutional Review Board: Telephone: 01/350000 extension: 5454.

E. Participant rights

Participation in this study is entirely voluntary. You are free not to participate. There will be no penalty if you do not want to be involved. Your decision not to participate will in no way influence your relationship with AUB or AUBMC

If you voluntarily agree to take part in the survey, but later change your mind, you can leave the study at any time without penalty, or submit a partially completed questionnaire.

Submission of a survey instrument confirms your voluntary participation in this research study. Please do not put your name or any other identifying information on the survey questionnaire. This will help us to protect your privacy.

APPENDIX V

ITEM LEVEL AUBMC VS. AHRQ 2011

Item-Level AUBMC vs. AHRQ 2011 Comparative Data Base

12 Composites and 42 items	AUBMC Average % positive	AHRQ 2011 Average % positive	Percentile of responses as compared to AHRQ % positive response
1- Team work within units	**69.97**	**80**	**Minimum-10th**
People support one another in this Unit	72.5	86	Minimum-10th
When a lot of work needs to be done quickly we work as a team to get the work done	78.7	86	Minimum-10th
In this Unit, people treat each other with respect	73.7	78	10th-25th
When one area in this unit gets really busy, others help out	55	69	Minimum-10th
2- Supervisor/Manager Expectations and actions promoting Patient safety	**59.42**	**75**	**Minimum-10th**
Supervisor/Manager says a good word when she/he sees a job done according to established patient safety procedures	69.6	73	25th-median
My supervisor/Manager seriously considers staff suggestions for improving pt safety	76.6	77	25th-median
Whenever pressure builds up, my supervisor/manager wants to do the work faster, even if it means taking shortcuts	59.8	74	Minimum-10th
My supervisor/manager overlooks patient safety problems that happen over and over	31.7	76	minimum
3- Organizational learning- continuous Improvement	**76.1**	**72**	**50th-75th**
we are actively doing things to improve patient safety	88.7	84	75th-90th
Mistakes have led to positive changes here	61.5	64	25th-median
After we make changes to improve patient safety, we evaluate their effectiveness	78.3	69	75th-90th
4- Management Support for patient safety	**74.9**	**72**	**50-75th**
Hospital management provides a work climate that promotes patient safety	83.8	81	10th-25th
The actions of hospital management show that patient safety is a top priority	86.4	75	75th-90th
Hospital management seems interested in pt safety only after an adverse event happens	54.5	61	25th-median
5- Overall Perceptions of Patient Safety	59.9	66	**10th-25th**
It is just by chance that more serious mistakes don't happen around here	55.8	62	10th-25th
Patient safety is never sacrificed to get more work done	55.4	65	10th-25th
We have patient safety problems in this unit	61.5	65	25th-median
Our procedures and systems are good at preventing errors from happening	67.1	72	25th-median

12 Composites and 42 items	AUBMC Average % positive	AHRQ 2011 Average % positive	Percentile of responses as compared to AHRQ % positive response
6-Feedback and communication about error	**69.4**	**64**	**75th**
We are given feedback about changes put into place based on event reports	57.1	56	50-75th
We are informed about errors that happen in this unit	75.1	65	75-90th
In this unit we discuss ways to prevent errors from happening again	76.1	71	50-75th
7- Communication openness	**59.5**	**62**	**25-50th**
Staff will freely speak up if they see something that may negatively affect patient care	66	76	Minimum-10th
Staff feel free to question the decisions or actions of those with more authority	53.8	47	75th-90th
Staff are afraid to ask questions when something does not seem right	58.7	63	10-25th
8- Frequency of events reported	**61.3**	**63**	**25-50th**
When a mistake is made but is caught and corrected before affecting the patient, how often is this reported	53.6	56	25-50th
When a mistake is made, but has no potential to harm the patient, how often is this reported	60.5	59	50-75th
When a mistake is made that could harm the patient, but does not, how often is this reported	69.8	74	25-50th
9- Teamwork across Units	**52.8**	**58**	**25-50th**
Hospital units do not coordinate well with each other	41.1	46	25-50th
There is good cooperation among hospital units that need to work together	59.1	59	50-75th
It is often unpleasant to work with staff from other hospital units	44	59	Minimum-10th
Hospital units work well together to provide the best care for patients	67.1	68	25-50th
10- Staffing	**32.5**	**57**	**Minimum-10th**
We have enough staff to handle the workload	54.1	56	25-50th
Staff in this unit work longer hours than is best for patient care	21.8	53	Minimum-10th
We use more agency/temporary staff than is best for patient care	35.3	67	Minimum-10th
We work in "crisis mode" trying to do too much, too quickly	19	50	Minimum-10th
11- Handoffs and transitions	**44**	**45**	**50th**
Things " fall between the cracks" when transferring patients from one unit to another	44.6	41	50-75th
Important patient care information is often lost during changes	55.6	50	50-75th
Problems often occur in the exchange of information across hospital units	35.4	43	25-50th
Shift changes are problematic for patients in this hospital	40.5	45	25-50th

12 Composites and 42 items	AUBMC Average % positive	AHRQ 2011 Average % positive	Percentile of responses as compared to AHRQ % positive response
12- Non punitive Response to error	**30.8**	**44**	**Minimu m-10th**
Staff feel like their mistakes are held against them	34.5	50	Minimum-10th
When an event is reported it feels like the person is being written up not the error.	38.8	46	10-25th
Staff worry mistakes they make are kept in their personal file	19	35	Minimum-10th

BIBLIOGRAPHY

AHRQ. "Hospital Survey on Patient Safety Culture"; available from http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/resources/hospscanform.pdf; Internet; accessed September 9, 2013.

Amiresmaili, M., Sogand, T. and Barati, O. (2010). "Measuring Safety Culture And Setting Priorities For Action At An Iranian Hospital". *Al Ameen Journal of Medical Science 3*(3), 237- 245.

Arabloo, J., Rezapour, A., Azar, F.E.F. and Mobasheri, Y. (2012). "Measuring Patient Safety Culture in Iran using the Hospital Survey On Patient Safety Culture (HSOPS):an Exploration of Survey Reliability and Validity". *International Journal of Hospital Research 1*(1), 15- 28.

Ardern, J. (2012). *Creating a safety culture*; available from http://www.commerce.wa.gov.au/Worksafe/PDF/Forums/safety_culture-Jane_.pdf; Internet; accessed 20 October, 2013.

AUBMC, Accreditation Office. (2013). "Patient safety and Risk Management, (QPS-Mul-001)." *AUBMC Policies and Procedures Manual.* American University of Beirut Medical Center, Beirut Lebanon.

AUBMC, Nursing Office. (2013). 'Nursing Performance improvement plan, (QPS NSG- 001)." *Standards of Care and Practice Manual.* American University of Beirut Medical Center, Beirut Lebanon.

Bennis, W. and Nannus, B. (1985). *Leaders: the strategies for taking charge.* New York: HarperandRow, *3*.

Blegen, M.A., Gearhart, S., O'Brien, R., Sehgal, N.L. and Alldredge, B.K. (2009). "AHRQ's Hospital Survey on Patient Safety Culture: Psychometric Analyses". *Journal of Patient Safety 5*(3), 139- 144.

Carless, S.A., Wearing, A.J. and Mann, L. (2000). "A Short Measure Of Transformational Leadership". *Journal of Business and Psychology 14* (3), 389- 402.

Chen, C. and Li, H.H. (2010). "Measuring Safety Culture in Taiwan using the Hospital Survey on Patient Safety Culture (HSOPSC)". *BMC Health Services Research 10*(152), 1- 10.

Ekenedo, G.O. (2013). "Framework for developing and sustaining sound safety culture in a developing economy". *European Journal of Natural and Applied Sciences 1*(1), 28-37.

El-Jardali, F., Dimassi, H., Jamal, D., Jaafar, M. and Hemadeh, N. (2011). "Predictors and outcomes of patient safety culture in hospitals". *BMC Health Services Research 11*, 45.

Hannah, K.L., Schade, C.P., Lomely, B.S., Ruddick, P. and Bellamy, G.R. (2008). "Hospital Administrative Staff vs. Nursing Staff Responses to the AHRQ Hospital Survey on Patient Safety Culture"; available from http://www.ahrq.gov/downloads/pub/advances2/vol2/advances-hannah_23.pdf; Internet; accessed October 1, 2013.

Hudson, P. (2001). "Safety Management and Safety Culture The Long, Hard and Winding Road". Proceedings of the First National Conference on Occupational Health and Safety Management systems.

Kohn, L.T., Corrigan, J.M. and Donaldson, M.S., (Eds). 1999. *To Err is Human. Building a Safer Health System.* Washington DC: National Academy Press.

McFadden, K.L., Henagan, S.C. and Gowen, S.R. (2009). "The patient safety chain: Transformational leadership's effect on patient safety culture, initiatives, and outcomes". *Journal of Operations Management* 27, 390–404.

Nie, Y., Mao, X., Cui, H., He, S., Li, J. and Zhang, M. (2013). "Hospital Survey on Patient Safety Culture in China". *Biomed Central Health Services Research 13*(228), 2- 11.

Podsakoff, P., MacKenzie, S., Moorman, S. and Fetter, R. (1990). "Transformational leader behaviors and their effects on followers' trust in leader, satisfaction, and organizational citizenship behaviors". *Leadership Quarterly 1*, 107-142.

Provnost, P. and Sexton, B. (2005)."Assessing safety culture: guidelines and recommendations". *Quality and Safety in Health Care 14***:**231-233.

Rousse, L. and Swansburg, R.C. (2009). *Management and leadership for Nurse Administrators.* Sudbury, Massachusetts: Jones and Bartlett Publishers.

Sexton, J.B., Helmreich, R.L., Neilands, T.B., Rowan, K., Vella, K., Boyden, J., Roberts, P.R. and Thomas, E.J. (2006). "The Safety Attitudes Questionnaire: psychometric properties, benchmarking data, and emerging research"**.** *BMC Health Services Research 6*:44.

Singer, S.J., Rivard, P.E., Hayes, J.E., Shokeen, P., Gaba, D., Rosen, A. (2013). "Improving Patient Care Through Leadership Engagement with Frontline Staff:A Department of Veterans Affairs Case Study". *The Joint Commission Journal on Quality and Patient Safety 39*(8), 349-360.

SM ICG. "Safety management system definition". Safety Management International Collaboration Group; available from http://www.easa.europa.eu/sms/docs/Safety%20Management%20International%20Collaboration%20Group%20(SM

%20ICG)%20phamphlet%20A4%20-v4.pdf; Internet; accessed October 21, 2013.

Sorra, J., Famolaro, T., Dyer, N., Nelson, D. and Khanna, K. (2011). "Hospital Survey on Patient Safety Culture: 2011 user comparative database report". Rockville, MD: Agency for Healthcare Research and Quality, April. AHRQ Publication No. 11-0030; available from:http://www.ahrq.gov/professionals/quality-patient-safety/patientsafetyculture/hospital/2011/index.html; Internet; accessed January 10, 2014.

Sorra, J.S. and Dyer, N. (2010). "Multilevel Psychometric proprerties of the AHRQ hospital survey on patient safety culture. *BMC Health Services Research*. *10*:199, 2- 13.

Squires, M., Tourangeau, A., Laschinger, H. and Doran.D. (2010). "The link between leadership and safety outcomes in hospitals". *Journal of Nursing Management 18,* 914–925.

Ugurluoglu, O., Ugurluoglu, E, Payziner, P.D., Ozatkan, Y. (2012). "Patient Safety Culture: Sample of a University Hospital in Turkey". *Pak j Med Sci. 28*(3):463-467.

Wiegmann, D.A., Zhang, H., von Thaden, T., Sharma, G. and Mitchell, A. (2002). *A synthesis of safety culture and safety climate research (ARL-02-3/FAA-02-2).* Savoy, IL: University of Illinois, Aviation Research Lab.