Using the Balanced Scorecard to Measure Patient Safety Culture in an Egyptian Public Hospital

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The safety and quality issues in healthcare industry have witnessed an increasing interest in the last two decades. Patients' safety, including the measurement of patient safety culture, has become a priority in healthcare organizations in one hand. On the other hand Balanced Scorecard (BSC) has emerged a strategic management tool that effectively combines financial and non-financial measures to guide strategic developments of organizations. This research investigates the patient safety culture and the possibility for adapting BSC to measure organizational safety culture in healthcare organizations with an empirical evidence with a large Egyptian public hospital. This research reveals that by selecting and evaluating the appropriate measures, in each perspective, requirements and actions can be identified and goals can be aligned and facilitated. Research results show that hospital staffs in Egypt are unsatisfied with patient safety culture in their organizations. However, the overall perception of patient safety grade was relatively better and efforts are being by hospitals for patient safety and quality improvement in order to reduce "blame and shame" and establish "just and systems oriented" culture - remain an issue that attempts to improve patient safety. According to the empirical evidence, a revised balanced scorecard framework (to achieve patient's safety culture) is proposed at the end of paper.

Keywords: Balanced scorecard, public service, health, patients' safety, Egypt.

Field of Research: Management Accounting

1. Introduction

Traditional performance measurement (PM) system used to focus on financial measures mainly on the tangible asset and financial obligation of an organization. Management needs to focus on financial measure and respond to intangible assets that are of value to the organization because of their substantial effect on the bottom line (Oliveira, 2001). However, when managers concentrate strictly on improving the tangible assets, they frequently miss the opportunity to evaluate and develop the intangible assets necessary to maximize the value of a customer over a lifetime. As McCunn (1998) argues that a PM system based solely on financial reporting indicators focuses on the past performance and takes a short- term view of strategy. Managers nowadays need more than traditional financial measures to run their businesses well as they need to manage the future of the

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organizations as well. Such needs require management to have better understanding of long-term objectives of the organization that can drive future success. The combination between financial and non-financial measures and short and long-term objectives can help organizations to achieve their vision and strategy. Since Balanced Score-card has emerged to overcome these deficiencies by mixing financial and non-financial measures, this research attempts to investigate the use of BSC in a unique and large public hospital in Egypt.

The remainder of the paper is organized as follows. Section two provides an overview of the theoretical background. This is followed by details of the research design and data collection. The analysis and finding are then presented and discussed in section four. Section five proposes a framework of the BSC. The final section offers summary and conclusion.

2. Background and Literature Review

2.1 BSC as a Performance Measurement System

Some studies examine the intensity of BSC, i.e. whether the use of BSC affect organizational performance (Thomas et al., 1999; Hoque and James, 2000; Kald and Nilsson, 2000; Oslon and Slater, 2002; Maiga and Jacobs, 2003; Bryant et al., 2004; Henschel, 2006). The results of this type of studies showed the positive relationships between the use of BSC and organizational performance.

A few studies demonstrate different interpretations and uses of BSC. They focus on the ways in which BSC is used and how it impacts performance (Sohn et al., 2003; Braam and Nijssen, 2004). Those studies demonstrate serious differences in the ways the BSC is or can be used as a comprehensive performance measurement (PM) system. According to those studies, BSC affects the quality of information for decision-making. However, when BSC co-aligned carefully to corporate strategy, it improves a company's strategic focus and accordingly, increases performance.

The results of BSC demonstrate both positive and negative relationships between the use of BSC and financial performance (Ittner et al., 2003; Davis and Albright, 2004; Davig et al., 2004). A possible explanation for these ambiguous and inconsistent findings may be due to the lack of appropriate control (for differences in the implementation) and actual practices of BSC.

2.2 BSC as a Strategic Management and Control System

The study of Malmi (2001) demonstrates how Finnish companies applied the BSC in their organizations. In particular, this study attempts to assess whether BSCs were used as an improved performance measurement system, or as a strategic management system. Gumbus and Lussier (2006) carried out three SME case studies to illustrate how these SMEs used a BSC to set strategy and align operations to improve performance. They suggested that BSC could be an effective management tool for small companies but bring a little doubt on BSC had a role to play in incentive or reward systems. Moreover, the study of Chow et al (1997) demonstrates the role of BSC as an effective management

tool for small companies. Other studies have included the components of strategic management system in the phases, or steps in the implementation of the BSC (Chow et al., 1997; Papalexandris et al., 2004; Fernandes et al., 2006).

Few studies demonstrate the implementation of BSC as a control tool. Most of those studies have neglected to define the characteristics and measures of the BSC -while using it as a control system. Additionally, Malina and Selto (2001) examined the effectiveness of BSC as a strategic communication and management control device in a large international organization. They found that the BSC was designed and implemented as an effective device for controlling corporate strategy. Nielsen and Sorenson (2004) found that the BSC is used as a tool in some Danish companies (that ensured strategic control on a short as well as a long-term basis). Moreover, they demonstrated an increasing need for a balanced control and management system in the respective organizations. Meer-Kooistra and Vosselman (2004) investigated the designs of the control system around the scorecard. They found that BSC might be more effective as part of an interactive control system than as part of a diagnostic control system.

3.   Research Method and Methodology

3.1   The Data Collection Method

As mentioned before, the objective of the study is to evaluate patient safety culture in an Egyptian hospital and attempt to provide explanation of some of the phenomena in patient safety culture in Egypt. The Hospital Survey on Patient Safety Culture (HSOPSC) tool is being used in a questionnaire to gather the required data (though survey method is associated with both advantages and disadvantages, Dillman, 2000; Churchill, 1995). The HSOPSC questionnaire is used to assess the baseline culture of patient safety in Egyptian hospital. Data on the areas of improvements is also sought through BSC methodology to improve hospital patient safety culture.

3.2 The Instrument

Although several instruments are available to assess patient safety culture/climate, however, this research applied the HSOPSC, since a manual is attached with it (at the website; www.ahrq.gov) which facilitates conducting and analyzing the survey. The dimensions and items of the questionnaire were adopted from HSOPSC, which was used as a pilot study (for testing) and then revised, and released in November 2004 by the Agency for Healthcare and Research Quality (AHRQ). HSOPSC has also been used in different countries including the United States, Canada, and Belgium, Japan, Taiwan, Dutch, Turkey, Iran, KSA and has been translated into different languages.

The HSOPSC contained a total of 42 items related to safety climate that are divided into subscales to measure 12 sub-dimensions of safety culture and six demographic questions. Responses to all items were close-ended. Each safety climate item in The Arabic (HSOPSC) uses Likert scales with five response options ranging from "Strongly Disagree", "Disagree", "Neither", "Agree", and "Strongly Agree",. Table (1) summarizes patient safety culture dimensions.

Table 1: Patient Safety Climate Dimensions of HSOPSC Tool

Patient safety climate factors of the HSOPSC	Definition: the extent to which	Items
Unit level aspect of safety culture		
Supervisor/Manager Expectations & Actions Promoting Safety	Supervisors/managers consider staff suggestions for improving patient safety, praise staff for following patient safety procedures, and do not overlook patient safety problems	4
Organizational Learning- Continuous Improvement	Mistakes have led to positive changes and changes are evaluated for their effectiveness	3
Teamwork within Hospital Units	Staff support one another, treat each other with respect, and work together as a team	4
Communication Openness	Staff will freely speak up if they see something that may negatively affect patient care, and feel free to question those with more authority	3
Feedback and Communication about Error	Staff are informed about errors that happen, given feedback about changes put into place based on event reports, and discuss ways to prevent errors	3
Non punitive Response to Error	Staff feel that their mistakes are not held against them, and mistakes are not kept in their personnel file	3
Staffing	There are enough staff to handle the workload and work hours are appropriate to provide the best care for patients	4
Hospital –level aspect of safety culture		
Hospital Management Support for Patient Safety	Hospital management provides a work climate that promotes patient safety and shows that patient safety is a top priority	3
Teamwork across Hospital Units, and	Hospital units cooperate and coordinate with one another to provide the best care for patients	4
Hospital Handoffs & Transitions	Important patient care information is transferred across hospital units and during shift changes	4
Outcome variable		
Overall perception of Safety	Procedures and systems are good at preventing errors and there is a lack of patient safety problems	4
Frequency of Event Reporting	Mistakes of the following types are reported: 1) mistakes caught and corrected before affecting the patient, 2) mistakes with no potential to harm the patient, and 3) mistakes that could harm the patient, but do not	3

(El-Jardali et al. 2010)

3.3 Sampling Frame and Data Collection

HSOPSC was carried out at a Children's cancer hospital, Cairo, Egypt, in spring 2012. It is to be noted that, this hospital is one of the main pediatric Cancer healthcare researches Center in Cairo. The total number of working staff at the hospital was 1500.

All Executives, group leaders and all direct care providers (like nurses, physicians, clinical pharmacist, and technician and administrators), clinical educators & managers, support service staff and managers were targeted to receive a survey. This research used individual as the unit of analysis. The source of data was personally administrated questionnaire. The simple random sampling was chosen. The sample size for that population was 306.

To facilitate data collection, the hospital's human resource department provided a list of staff members that included name, job title, unit or department, and site. These lists, together with self-reported job category and care-setting data provided on the questionnaires, were used to assign survey respondents to a staff group, unit/department, and care setting. This approach allowed us to determine response rates and perform analysis for each of these groups. All targeted staff was sent a survey and cover letter. The survey on patient safety took place during March 2012 and April 2012 at Children cancer hospital in Cairo. To ensure the privacy of the respondents, the survey was strictly anonymous. Respondents were asked to put their completed questionnaire in a sealed envelope. The envelopes were collected by the researcher in order to achieve accuracy and maintain confidentiality. The final response rate for the survey was 73.85%.

4. Analysis and Findings

4.1 Descriptive Statistics

This study shows descriptive statistics of the demographic characteristics of respondents as presented in table (2) below.

Table (2): Demographic characteristics of respondents

Staff Position (Job Type)		Overall	Supervisor	Non Supervisor
	physician	32	4	28
	Nurse	109	15	94
	Pharmacist	21	6	15
	Administrator and technician	64	5	59
Working time in hospital (Experience)				
	Less than 6 months	35	0	35
	6 months to 1 year	11	0	11
	1 to 2 years	30	5	25
	2 to 3 years	34	4	30
	3 to 4 years	30	8	22
	4 years or more	86	15	71
Contact of employees to patient				
	Direct to patient	37	3	34
	Indirect to patient	27	2	25
Level of position				
	Supervisor	30(13%)	-	-
	Nun supervisor	196(87%)	-	-

The average percentage of positive responses, defined as the average of the item-level percent positive responses within a HSOPSC dimension, represented positive reaction toward patient safety culture. Table (3) shows the average percentage of positive responses for each of the 12 dimensions that HSOPSC measures for both the 2011 AHRQ data and the data from this study (Egypt) as follows:

First, for the outcome-level measurements of patient safety culture includes "Overall perceptions of safety" and "Frequency of event reporting" (items 1 and 2 in Table 3). Overall perception of patient safety culture is an indication of good procedures and systems for preventing errors and the lack of patient safety problems. The percentage of positive response for this item is 72%, a little higher than the AHRQ result (63%). For the frequency of event reporting factor, the positive response rate is 13% for Egypt, and 59% for the AHRQ data, which is the lowest score among the twelve dimensions of patient safety culture.

Second, the hospital-level aspects of patient safety culture cover items 3, 4, and 5 in Table (3). The "Hospital management support for patient safety" dimension is an indication of whether the management team provides a work climate that promotes

patient safety. In Egypt, the positive response rate for this item is 69%, which is the same as the AHRQ data (69%). The positive response rate for Egypt (51%) is lower than that for the AHRQ data (57%) in terms of "Teamwork across hospital units" dimension. Hospital workers in Egypt seem statically to have better cooperation and coordination across different units or departments. Medical problems and accidents may occur during shift changes. Therefore, unhindered handoff and transition is desirable to assure patient safety in the hospital. However, most of respondents in this study feel that hospital is not doing enough (42%)

Third, the unit level aspect of patient safety culture represents the perception of respondents on patient safety culture within their department and unit. The unit level aspect of patient safety covers items 6, 7,8,9,10,11 and 12 in table (3).

Table (3): Average positive response rate for the HSOPSC results for AHRQ and EGYPT data.

Items	HSOPSC dimensions	AHRQ Average positive response		EGYPT Average positive response	
		(%)	Rank	(%)	Rank
Outcomes of Safety Dimensions	1. Frequency of Event Reporting	59%	8	13%	12
	2.Overall perception of Safety	63%	5	72%	1
Dimensions at Hospital Level	3.Teamwork across Hospital Units	57%	9	51%	7
	4.Hospital Management Support for Patient Safety	69%	3	69%	3
	5.Hospital Handoffs & Transitions	45%	11	42%	8
Dimensions at Unit Level	6.Supervisor/Manager Expectations & Actions Promoting Safety	74%	2	71%	2
	7.Organizational Learning- Continuous Improvement	69%	4	52%	5
	8.Teamwork within Units	78%	1	52%	6
	9.Communication Openness	61%	7	36%	9
	10.Feedback and Communication about Error	62%	6	14%	11
	11.Non punitive Response to Error	43%	12	31%	10
	12.Staffing	55%	10	54%	4

The average percentage of positive responses for "Teamwork within units" is 52% in Egypt, which is lower than that reported by the AHRQ (78%). The results indicate that most of the respondents in this study feel moderately supportive and respected in their unit or work place, and they are likely to cooperate and coordinate with their co-workers. For the "Supervisor/manager expectations and actions promoting safety" dimension, the average percentage of positive responses for Egypt is 71%, which is lower than the AHRQ data (74%). The "Organizational learning--continuous improvement" dimension of patient safety culture represents a learning culture in which mistakes lead to positive changes and changes are evaluated for effectiveness. This indicates that the organization has patient safety culture constructive improvement activities. The percentage of positive responses for organizational learning was significantly lower than in the AHRQ data (52%) in this study. The positive response rates for "Feedback and communication about error" (14%) and "Communication openness" (36%) dimensions, were much lower than the AHRQ data. "

In the past, when failure or error occurred, it usually resulted in punishing people instead of acknowledging the problem existed. The "Non-punitive response to error" dimension measures to what extent the hospital staff feels that their mistakes are not held against them, and the mistakes are not kept in their personnel file. For both Egypt and the AHRQ data, the positive response rate for this item is lower than 50%. The last unit-level of patient safety culture dimension is "Staffing"; it shows whether a health care unit has adequate staff allocation to handle the workload and the working hours are appropriate for providing the best care for the patients. The percentage of positive responses for those items was 54% and 55% for Egypt and the AHRQ data respectively. According to the above data it can be concluded that the differences between the AHRQ data and the Egyptian data for most of dimensions are significantly different (in a statistical sense).

4.2 HSOPSC Application in Egyptian Hospital

To justify the validity of using HSOPSC on assessing safety culture in Egyptian hospital, Mann Whitney test was performed. As discussed in literature review, it is important to examine the significance of demographic factors (control variables) affecting patient safety culture dimensions in Egypt in order to understand its special characteristics. The suggested control variables that affect safety dimensions include location, experience inside hospital, job type, and contact to patient.

First, Location was divided into two groups: critical and non-critical (critical areas include Operation Theater, critical care unit, and emergency departments). The results show that "Feedback and communication about error" and "organization learning and continuous improvement" items are highly significant at 5% level (as shown in table 4). Location did not show any significant on other patient safety culture dimensions. Second control variable is experience inside the hospital. Table (4) shows the effect of experience inside the hospital on patient safety culture dimensions. The respondents were divided into two groups more than 3 years and equal or less than 3 years' experience. The results demonstrate that there is significant of experience inside hospital on "overall perception of Safety" at 5% level and for "organization learning and continuous improvement" at 10% level. Experience inside hospital does not show any significant on other patient safety culture dimensions.

Third factor is job type; respondents were divided into medical staff and non-medical staff. Medical staff includes physician, nurses, and pharmacist, and non-medical staff includes administrators, secretaries and other staff members- were not classified under medical criteria. Table (4) presents that there is a significant of job type on "hospital management support for patient safety" at 10% level.

Finally, two groups were identified (contact to patient and no contact to patient) for the factor of contact of employees to patient. Table (4) demonstrates that there is no significant effect of contact to patient on perception of patient safety culture dimension.

Table (4): Effect of control variables on patient safety culture dimensions using Mann Whitney Test

Levels	Dimensions (Items)	Location		Experience		Job Type		Contact to Patient	
		Value	Sig.	Value	Sig.	Value	Sig.	Value	Sig.
Outcomes measures	Frequency of event reporting	3184	0.428	4625.5	0.653	3176.5	0.133	2552.5	0.901
	Overall perceptions of Safety	3117	0.278	4014	0.025**	3519	0.407	2359	0.186
Safety culture dimension Unit Level	Superior/manager Expectation & action promoting Safety	3142.5	0.501	4280.5	0.19	3404	0.329	2719	0.972
	Organization learning and continuous improvement	2806	0.047**	4190	0.064*	3585	0.511	2710.5	0.836
	Teamwork **within** units	2922	0.1	4451	0.226	3412	0.261	2313.5	0.141
	communication openness	3271	0.516	4613	0.411	3370.5	0.217	2702.5	0.817
	Feedback and communication about error	2772	0.039**	4691.5	0.525	3556.5	0.466	2637.5	0.661
	Non-punitive response to error	3351.5	0.664	4686	0.518	3540.5	0.44	2771.5	0.991
	Staffing	3430	0.842	4863.5	0.821	3556.5	0.464	2332	0.156
Safety culture dimension hospital Level	Teamwork **across** hospital units	3044	0.197	4318.5	0.128	3298	0.153	2507	0.394
	Hospital management support for patient safety	3367	0.705	4397.5	0.179	3197.5	0.087*	2660	0.713
	Hospital handoffs and transitions	3457.5	0.904	4557.5	0.342	3703.5	0.743	2342	0.169

* Statistically significant at the 0.10 level; ** statistically significant at the 0.05 level

5. Manage Patients' Safety Culture Through Balanced Scorecard Methodology

Kaplan and Norton (1992) outlined four perspectives in the balanced Scorecard in order for it to be developed effectively and be able to measure safety culture successfully. First, set the goals and measures for each perspective. Focus on this perspective should lead to measures that would likely relate to such elements- as management safety policy, commitment, accountability, and leadership. The use of those elements in BSC results in a number of criteria reflecting management control activities such as directing, leading, planning and co-coordinating.

Learning perspective goals may include learning and continuing to improve safety performance level, building highly competent staff, empowering staff, establishing an effective strategic feedback system, and providing adequate patient's Safety training.

Measures should focus on issues such as encouraging bottom-up information low and feedback, improving supervisor/staff relationships, enhancing skills through education and training, nun-punitive response about error, empowering staff aligning incentive and reward schemes that are related to superior safety behavior, and so on. Measures may also include number of safety initiatives, extent of workforce proactive involvement to improve safety, extent of ability to transfer learning into workplace, number of hours of competency/induction training number of safety audits/reviews, etc. These measures facilitate the periodic performance review as well as the progress made by meeting the predetermined strategic objectives.
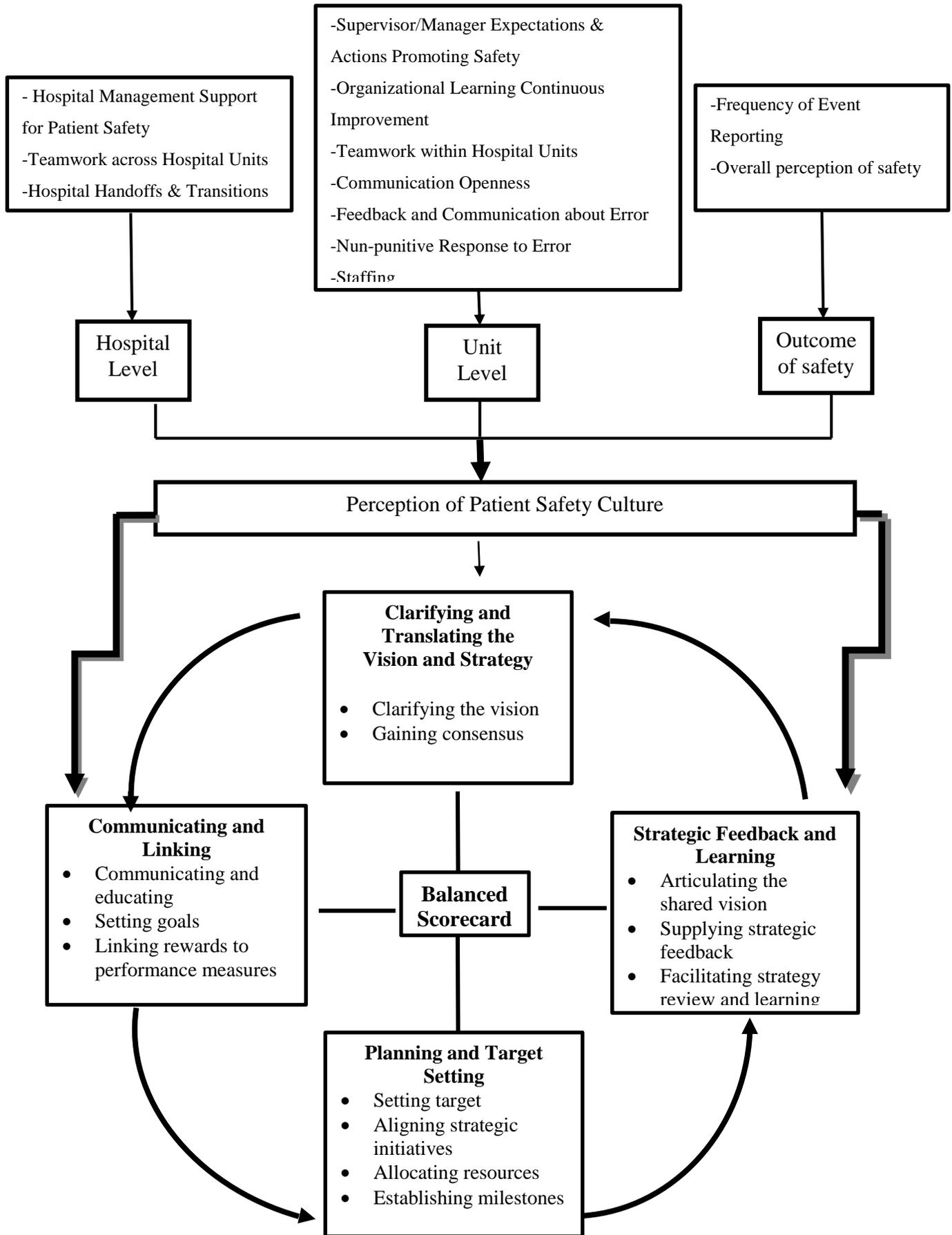
Operational perspective/goals may include several measures that range from the establishment of a safe workplace and how to maintain it, the establishment of an effective operational feedback system, the implementation of an efficient follow-up system, the execution of a more operative safety planning, and the creation of an improved working environment. Considering those goals, measures would likely relate to different elements, like score of whether safety requirements are achieved, score of safety audits/focus groups, remedial actions ratio is implemented, Number of incidents due to poor safety integration are planned, current working relationships degree of satisfaction, and behaviors & attitude towards safety degree of safer work place (like Team working , staffing, hospital handoffs and transitions).Table (5) presents different perspectives and their goals and measures.

Table (5) Proposed Balanced Scorecard Frame work to achieve patient's safety culture

	Perspectives	Goals	Measurements
1	Management	• Accident elimination • Reduce number of accident • Improve output • Business image enhancement • Reduce accident related cost	• # of medication error, Number of reported incident • Extent of management participation to develop safety • Amount of Money saved on accident.
2	Learning	• Ongoing to improve safety performance • Build highly competent and empower staff • Launch an active strategic feedback system • Deliver satisfactory patient's Safety training	• Number of safety initiatives • Degree of capability to transfer learning into workplace • Degree of workforce pre-emptive involvement to improve safety • # of safety audits / reviews, • # of hours of induction training
3	Operational	• Create and maintain a safe place of work • Start an operating feedback system • Execute more effective safety arrangement • Produce a well working situation • Implement an well-organized follow-up system,	• % of compliance and non-compliance to safety requests • Number of safety audits • Ratio of implemented remedial actions • # of incidents due to poor safety integration into planning • Level of satisfaction with current working associations • Safe attitude and behaviors to safety degree of safer place of work
4	Customer	• Increase patient Satisfaction • Enhance staff satisfaction • Increase staff morale	• Patient satisfaction rating • # of legal suits and complains • % of Staff satisfaction • patient/ staff overall awareness of safety

The product of the safety culture is represented in the customer perspective. It can be used to assess how employees and patient perceive safety at hospital. The study of Mohamed (2003) stated that the customer perspective would also indicate whether additional opportunities are present for improving safety performance and enhancing safety culture. Goals may include ensuring patient and staff satisfaction and enhancing staff morale. The measures may include patient satisfaction rating, number of complains, legal suits, and patient/ staff overall perception of safety. Figure (1) proposes a comprehensive framework that incorporates different perspectives and the interrelation among different perspectives.

Figure (1):   Linking BSC to Perception of Patient Safety Culture

-Supervisor/Manager Expectations &
Actions Promoting Safety
-Organizational Learning Continuous
Improvement
-Teamwork within Hospital Units
-Communication Openness
-Feedback and Communication about Error
-Nun-punitive Response to Error
-Staffing

- Hospital Management Support
for Patient Safety
-Teamwork across Hospital Units
-Hospital Handoffs & Transitions

-Frequency of Event
Reporting
-Overall perception of safety

Hospital
Level

Unit
Level

Outcome
of safety

Perception of Patient Safety Culture

**Clarifying and
Translating the
Vision and Strategy**

- Clarifying the vision
- Gaining consensus

**Communicating and
Linking**
- Communicating and
educating
- Setting goals
- Linking rewards to
performance measures

**Balanced
Scorecard**

**Strategic Feedback and
Learning**
- Articulating the
shared vision
- Supplying strategic
feedback
- Facilitating strategy
review and learning

**Planning and Target
Setting**
- Setting target
- Aligning strategic
initiatives
- Allocating resources
- Establishing milestones

6. Summary and Conclusion

This paper focuses on Patient safety culture assessments as a recognized tool in patient safety improvement by access patient safety culture in Egyptian's hospital. It also assesses a number of key patient safety cultural dimensions, focuses at both the unit/department level, as well as hospital wide. This multi-dimensional approach provides a level of specificity that makes it useful as a tool to guide patient safety improvement interventions.

This study indicated that, lack of an established system to report events inhibited the hospital to review events systematically; this finding highlights the importance of developing a reporting system as a priority for this hospital. Staff general perception about the existing a punitive response to events is a main barrier facing any safety improving initiative. This study highlighted the importance of cultural change prior to any safety initiative. This research investigates the possibility for adapting BSC to measure organizational safety culture in Egyptian public healthcare hospital. It attempts to explore BSC to provide with a medium to translate the organization's safety policy into a clear set of goals across four BSC perspectives by translating the strategic patient safety culture goals into a performance measures (KPIs). It suggested goals and performance measures that cover the requirement of the four perspectives of Balanced Scorecard. Also, the study provides and proposed a guide line for building Balanced Scorecard model to achieve more improvement in patient safety culture by moving into the stage of being used as performance management rather than only as performance measurement.

This paper has contributed to both theoretical and practical knowledge of patient safety culture into two fold. First, Proposed Balanced Scorecard Framework by translating patient's safety culture goals into set of performance measures. Second, building model of BSC used as a performance management which Managers can use it to enhance interactive control and double-loop learning through the implementation of the BSC. This can be achieved by distributing the performance measures based on hierarchical two-way processes not by focusing primarily on top-down performance measurement. Managers can incorporate and increase "feedback" and "feed-forward" by using this model of BSC to help management teams articulate, communicate and monitor the implementation of the strategy of patient safety culture.

While the ultimate goal of patient safety efforts is to reduce the risk of health care associated injury or harm to patients. A limitation of this study is that we were unable to examine the relationship between patient safety culture survey scores and patient outcomes. While there is abundant theory, case studies, and descriptive research on culture and culture change, there is still very little criterion-related research that links culture to "hard," non-perceptual outcomes like patient harm or cost savings. These are the data that move boards-of-directors and administrators to allocate resources and take action and are critical to telling the story of how patient safety culture impacts the bottom line. More research is also needed about how to change culture.

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