The Impact of Saudi (CBAHI) Accreditation on Enhancing Patient Safety and Improving the Quality of Care Indicators

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Abstract

The main aim of the dissertation is to evaluate the impact of Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) accreditation in enhancing patient safety and improving the quality of care indicators [1]. The importance and support of CBAHI is highly observed from the healthcare institutes [2]. The researcher used the experimental approach for data analysis, which collected from five indicators for patient safety, and another five indicators for quality improvement, all indicators were approved by CBAHI, the indicators were collected over two periods each period consists of six months before and six months after the accreditation [3]. The study applied in Dammam Regional Laboratory and Blood Bank in KSA. The most important findings were the negative impact of CBAHI upon most of the patient safety indicators, three indicators showed statistically insignificant negative impact and those indicators were: specimen identification error indicator (P 0.5111), and the corrected laboratory report indicator (P 0.6849), and the adverse donor reaction indicator (P 0.1285). For the other two indicators there was a statistically significant negative impact, these two indicators named blood/blood components availability (P 0.0007) and critical value notification (P 0.0299). The study also records a weak positive effect on the quality improvement indicators as only one indicator shows statistically significant improvement, which is the blood/blood components wastage (P 0.0139). On the other hand, the other four indicators showed statistically insignificant improvement, and those four indicators were: The turnaround time indicator (P 0.4934), internal quality control accuracy indicator (P 0.5603), the blood contamination rate (P 0.4729) and laboratory specimen rejection (P 0.0687). The most important recommendation of the study: Focusing on continuous quality improvement and patient safety more than standard inspection by CBAHI using the unscheduled accreditation visits, also activation of the institutional self-assessment. Finally, creation of patient safety and quality culture.

Keywords: CBAHI; Patient Safety; Quality of Care Indicators

Introduction

The high concern about Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) Accreditation for Enhancing Patient Safety and Improving the Quality of Care is increasing and highly supported nowadays [4]. The safe healthcare attracted the international attention and interest which considered the patient safety, which is affected by the medical errors, as a priority in healthcare [5]. In the Middle East, the quality of healthcare and its improvement considered the top priority for government. With the direct and important role of laboratory services in diagnosis and management of patient, it considered a corner stone in in health care and many international and national programs for laboratory quality indictor's implementation and follow used as quality improvement tools [6]. In the presence of rare studies that evaluate the impact of this accreditation on the health care institutes especially with the recent implementation of regional laboratories and central blood banks accreditation, the importance of this research became obvious especially if we considered the magnitude of services done by those central laboratories to the private and governmental health care institutes [7]. We will try in this research evaluate the impact of Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI). Accreditation of regional laboratories and central blood banks for Enhancing Patient Safety and Improving the Quality of Care indicators using a research study of five patient safety indicators and five quality improvement indicators in Dammam regional laboratory and central blood bank. Those indicators were precisely selected as highly representing indicators for patient safety and quality improvement in laboratories and blood banks and considered obligatory by CBAHI to be measured and improved by laboratories and blood banks. The research timeframe will be six months before the accreditation with evaluation of indictors change six months after.

Objectives

With the strong believe that CBAHI is an important tool for enhancing patient safety and improvement of health quality, the value of this study appeared in the attempt to identify the impact of CBAHI to enhance patient safety and improve quality of care in regional laboratory and central blood bank. So, we can define the objectives of

this research in the following:

- Recently implemented CBAHI accreditation for regional laboratory and central blood bank, which need more studies to ensure its success and empower the trial with improving its week points.

- Clarify the role of CBAHI in enhancing patient safety in regional laboratory and central blood bank. Despite the presence of many standards to be implemented, the accreditation process occurred every three years without any clear tool for follow up and evaluation of patient safety enhancing effect of these standards. So, the research initiated a clear tool for follow up of patient safety indicators to cover this gap and the research concentrate on indicators study and follow up as an image for CBAHI impact on patient safety enhancing.

- Clarify the role of CBAHI in improving health care quality in regional laboratory and central blood bank. As the research initiated a clear tool for follow up of health care quality indicators. The research was suspected to add more value in the benefits from CBAHI pros and improve cons.

Methodology

This research depends on Experimental study as it studied the effect of pre-considered variables on the research problem. The research fixed one variable and studied its impacts and effects. This research involved an independent variable, which was CBAHI accreditation, and two dependent variables, which were patient safety enhancement and health care quality improvement. Both are followed by independent variables, which are mentioned in the next page. The research specimen consisted of five patient safety indicators and five health care quality improvement indicators, which were all approved by CBAHI and regional laboratory administration. The time interval to collect those indicators were divide to two periods, one from 1/2017 to 6/2017 as first period to be compared to the second period from 7/2017 to 12/2017. Each indicator data was collected monthly through laboratory information system of Dammam regional laboratory and central blood bank units. Then calculated as percent from numerator denominator. All the results were statistically calculated for their mean, standard deviation and charts, paired T test and p value were used to

signify the statistical comparison and significance of correlation. The following table showed indicators data (Table 1):

Results

We had relied in this section on ten indicators that represent patient safety and health care quality improvement. Indicators were collected and calculated monthly for a period of six months before CBAHI accreditation, then statistical analysis with mean and standard deviation were calculated. The same indicators then collected monthly for a period of six months after CBAHI accreditation, also, statistical analysis with mean and standard deviation were calculated after the accreditation. Paired T and P value were calculated for statistical significance of difference to identify the relationship between patient safety indicators before and after CBAHI accreditation and whether there is statistically significant improvement or deterioration or not.

The next table illustrated Sampling Size & Total Specimen Number for each Indicator (Tables 2 and 3):

Discussion

The study suggested improvement and enhancing in the patient safety after CBAHI accreditation after its question of the extent of CBAHI accreditation on improvement and enhancement of patient safety. But the research concluded the reverse effect of CBAHI on patient safety indicators as two of the indicators were significantly deteriorated (Blood and blood components availability and Laboratory critical value notification rate) and the other three were not significantly changed (Laboratory specimen misidentification percent, Corrected laboratory reports percent and Donor adverse reactions percentage). The deterioration of these standards could demonstrate the inability of CBAHI to improve patient safety especially from the point of outcome, as CBAHI depended mainly on evolution of process and procedure rather than patient safety. These results conceded with the results of Al Musaa by and Shaw study at 2017 that demonstrated the concentration of CBAHI on measuring the process rather than the outcome. Despite the prove that the true process leads to true outcome, but it is not sure that the accreditation almost leads to true process. Briefly, to prove that, the quality and its indicators had to be improved. After the study

Table 1: Patient safety & health care quality improvement indicators definition, calculation and target result.

No	Indicator Name	Indicator Calculation	Target Result	Improvement Criteria
Patient Safety Indicators				
1	Laboratory specimen misidentification percent	Number of misidentified specimens in specific month in a percent to the total number of tested specimens in the same month	Zero %	Result decreasing
2	Corrected laboratory reports percent	Number of corrected lab report inspecificmonth in a percent to the total number of reports of results in the same month	Zero %	Result decreasing
3	Blood and blood components availability	The number ofblood and blood components available in Central blood bank store in a specific month	2000 blood and blood components	Result increasing
4	Donor adverse reactions percentage	Number of donors who gate adverse reaction during or after donationinspecificmonth in a percent to the total number donors in the same month	Zero %	Result decreasing
5	Laboratory critical value notification rate	Number of laboratory critical value with failure or incorrect notificationinspecificmonth in a percent to the total number oflaboratory critical value in the same month	Zero %	Result decreasing
Health care Quality Improvement Indicators				
6	Laboratory specimens TAT (Turnaround Time) indicator	Number of laboratory specimen resulted outside the pre-planned TAT inspecificmonth in a percent to the total number of tested specimens in the same month	Zero %	Result decreasing
7	Internal laboratory quality control result	Number of inaccuratelaboratory quality control result inspecificmonth in a percent to the total number oflaboratory quality control result in the same month	Zero %	Result decreasing
8	Blood culture contamination rate	The number ofcontaminated blood cultureinspecificmonth in a percent to the total number of received blood culturein the same month	Zero %	Result decreasing
9	Blood and blood component wastage rate	Number of wastedblood and blood component inspecificmonth in a percent to the total numberblood and blood component produced in the same month	Zero %	Result decreasing
10	Laboratory specimen rejection rate	Number of laboratory specimen rejected inspecificmonth in a percent to the total number oflaboratory specimen received in the same month	Zero %	Result decreasing

Table 2: Sampling size &total specimen number for each indicator.

No	Indicator Name	Sampling Size (Total Specimen No)		Percent of sample
		Before CBAHI	After CBAHI	
Patient Safety Indicators				
1	Laboratory specimen misidentification percent	82410	62690	10%
2	Corrected laboratory reports percent	50764	71709	100%
3	Blood and blood components availability	6300	3594	100%
4	Donor adverse reactions percentage	5748	3925	100%
5	Laboratory critical value notification rate	389	343	100%
Mean of sample number / month		4854	4742	
Health care Quality Improvement Indicators				
6	Laboratory specimens TAT (Turnaround Time)	82676	119459	100%
7	Internal laboratory quality control result	21543	19041	100%
8	Blood culture contamination rate	3440	2923	100%
9	Blood and blood component wastage rate	6300	3594	100%
10	Laboratory specimen rejection rate	33743	34834	100%
Mean of sample number / month		4923	5995	

Table 3: Summary of research results.

No.	Indicator Name	Indicator Change	Statistical Significance	P value	Sample Size	
					Before CBAHI	After CBAHI
Patient Safety Indicators						
1	Laboratory specimen misidentification percent	Improved	Insignificant	0.511	8241	6269
2	Corrected laboratory reports percent	Deteriorate	Insignificant	0.6849	50764	71709
3	Blood and blood components availability	Deteriorate	Significant	0.0299	6300	3594
4	Donor adverse reactions percentage	Deteriorate	Insignificant	0.1285	5748	3925
5	Laboratory critical value notification rate	Deteriorate	Significant	0.0007	389	343
Health care Quality Improvement Indicators						
6	Laboratory specimens TAT (Turnaround Time)	Improved	Insignificant	0.4934	82676	119459
7	Internal laboratory quality control result	Improved	Insignificant	0.5603	21543	19041
8	Blood culture contamination rate	Improved	Insignificant	0.4729	3440	2923
9	Blood and blood component wastage rate	Improved	Significant	0.0139	6300	3594
10	Laboratory specimen rejection rate	Improved	Insignificant	0.0687	33743	34834

of the first indicator of Laboratory specimen misidentification percent, its result was statistically insignificant different that considered failure of CBAHI to improve this target which considered the first IPSG (International Patient Safety Goal). This required more CBAHI activity in identification, activation and improvement of this goal [8].

With the study of the second indicator result as usual, the research concluded no improvement of the indicator named Corrected laboratory reports percent. In spite of being a patient safety indicator that is important for post analytical measure and 70% of medical decision depended upon it, the indicator showed no improvement because of shortage of improvement tool and its follow up that lead to inactivation of that standard [9]. The research concluded deterioration of the blood and blood components availability indicator after CBAHI accreditation that disagree with CBAHI goal of minimum requirement of blood and blood components availability. This result suggested the lack of CBAHI tools and creation to deal with or to improve such critical requirement [10]. The study also concluded insignificant deterioration of this indicator that could be due to increase in the staff awareness about donor adverse reaction diagnosis and notification without ignorance or masking. This suggestion is strengthening by the finding of change in the blood bank staff and policy. The most dangerous finding in the research was significant deterioration of "critical value notification rate" indicator. This indicator considered one of the most important goals of the IPSGs of the WHO talking about good communication and the critical value notification represented this goal

[11]. Therefore, CBAHI inability to improve this goal needs rapid and effective plan and procedures to avoid the patient safety drawbacks. The research suggested an increase and improving of health care quality. The research concluded that four health care quality improvement indicators were not statically changed (those indicators were: Laboratory specimens TAT (Turnaround Time), internal laboratory quality control result, blood culture contamination rate and Blood and blood component wastage rate) with indicator only showed statistically significant improvement which was Laboratory specimen rejection rate. This indicated the weak effect of CBAHI on improvement health care quality indicators.In spite of the non-significant improvement of health care quality indicators showed by the research, the main suggested case was CBAHI survey system that depends upon snapshot investigation rather than continuous health care quality improvement.

The research concluded that CBAHI have no significant effect on laboratory specimens TAT that affected the health care derived to the patient. This raised the requirement for specific identification of the meaning of turnaround time by CBAHI with creation of clear achievable targets [12]. The research previously clarified the importance internal laboratory quality control result in quality improvement and concluded the non-significant improvement of this indicator (the seventh indicator) after its result analysis. The main cause of that could be the defects in continuous CBAHI follow up of internal laboratory quality control result with no improvement projects neither created nor supervised by them [13]. The research documented during dealing with

different CBAHI chapters that there was neither connection between the different chapters nor departments. This documentation was very clear in result of that "blood culture contamination rate" indicator that needs a communication and cooperation between different departments who extract the blood and the laboratory that culture CBAHI ignore this communication and cooperation [14]. The research demonstrated that the only significant improvement was in "blood and blood component wastage rate" indicator (the ninth indicator). This could be related to the significant deterioration of the third indicator of blood and blood components availability that leads to implementation of regional laboratory and central blood bank to improvement plans to improve the availability of blood and blood components to enhance patient safety. These plans lead to improvement of blood and blood component wastage rate that enhanced our idea about the importance of follow up of indicators and creation of quality culture related to the improvement plans [15]. The laboratory specimen rejection rate indicator shares the same idea of the eighth indicator that enhances the importance of cooperation between different departments that request and extract the specimen and the laboratory. The research also concluded non-significant improvement that demonstrated defect in the pre-analytical phase. CBAHI showed defect in clear tools to evaluate supervise and follow up of this phase in spite of the presence of indicator as ISO recommended [16]. The research also documented that change of CBAHI to obligatory accreditation transferred its aim to fulfillment of standard compliance rather than continuous quality improvement. This was because of the transfer of accreditation aim to external forcing rather than self-desire of continuous quality improvement; this leaded to inaccurate standards implementation and if implemented there was no continuity as mention in the study of Defkran and Ofarel at 2014. They added in their study, that the non-encouragement of health care worker in KSA came from their rejection of change especially if this change is continuous. Also, their employment security make difficulty to convince them to change, this beside their convincement that they are giving the best medical and laboratory health care and that CBAHI depending mainly in improving the process and framework rather than continuous quality improvement. So, involvement of all health care workers in preparation for CBAHI accreditation and in improvement projects with increment of CBAHI lectures and workshops is essential to bypass this problem [17]. One of the most important reasons for deterioration of CBAHI indicator was depending of CBAHI upon snapshot evaluation rather than continuous evaluation process that leaded to indicator improvement just before and during the survey with direct deterioration after the end of survey especially with long period between the accreditation surveys (three years). Therefore, the research recommended involvement of all health care workers in continuous improvement process. The transfer of CBAHI from scheduled to unscheduled survey visit, as many of accreditation commissions doing, is very important for standards compliance. As many of those accreditation commissions applied the surveyor auditor tool who follow up the health care process and discover the pros and cons that help in evaluation of standards and indicator compliance and improvement of health care and patient safety [18]. In spite of the presence of patient safety and health care quality indicators, the research found CBAHI did not care about indicator follow up? Unlike many accreditation commissions that requesting regular receiving of indicator results to review and follow up that enhance the health care institute demands for self-assessment and creation of quality improvement plan to improve the result of these indicators. This leads to significant health care and patient safety improvement [2]. From all the above, it was clear that CBAHI depended upon traditional tool for surveying and accreditation. They concentrated on evaluation of

structure and policies more than outcome and work process that leads to negative impaction on the development and improvement of patient safety and quality. In addition, the health care institutes are in deep need for strategic plan based continuous quality improvement projects that must be followed and supervised by the accreditation commission. This could lead to more improvement and correction of weak pointed especially if depending upon close follow up of patient safety and health care quality improvement indicators [19].

Recommendations

The study recommended the following:

* Concentration on continuous total quality management program with creation of work media with patient safety and quality improvement atmosphere. CBAHI standards have not to measure only the existent improvement and situation, but also must continuously measure it and find a tools and standards to reflect and measure the continuity of improvement processes. The study detected deterioration of the indicators with the end of CBAHI visit that could not create a total quality management culture to continue promoting patient safety and health care quality after the visit as if before it.

* CBAHI must study the change from scheduled visits to suddenness visits.More concentration on patient safety and health care quality improvement rather than follow up their standards is required.

* Activate the role of internal navigator to be referred to CBAHI that will promote the quality and accreditation importance culture.

* Activate the self-assessment policy by the institutes itself to be received with the patient safety and health care quality improvement indicators results twice a year, as the study proved the deterioration of those indicators without notification nor improvement planning by CBAHI.

* The study recommended all staff sharing in preparation and follow up of accreditation to enhance the cooperation between them and between different departments and improve the quality tong speaking. As the study proved defect in the indicators that need between communications like blood culture contamination rate and "laboratory specimen rejection rate" indicators.

References

1. Almasabi M, Thomas S (2017) The impact of Saudi hospital accreditation on quality of care: a mixed methods study. Int J Health Plann Manage 32: e261-e278.https://doi.org/10.1002/hpm.2373

2. International Organization for Standardization (2013) UNI EN ISO 15189-2013, Medical laboratories, requirement for quality and competence, Geneva, Switzerland.

3. Alsakkak MA, Alwahabi SA, Alsalhi HM, Shugdar MA (2017) Outcome of the first Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) primary health care accreditation cycle in Saudi Arabia. Saudi Med J 38: 1132.https://dx.doi.org/10.15537/smj.2017.11.20760

4. Wagar EA, Tamashiro L, Yasin B, Hilborne L, Bruckner DA (2006) Patient safety in the clinical laboratory: a longitudinal analysis of specimen identification errors. Arch Pathol Lab Med 130: 1662-1668.https://doi.org/10.1043/1543-2165(2006)130[1662:PSITCL]2.0.CO;2

5. Alkhenizan A, Shaw C (2010) The impact of accreditation on the quality of healthcare services: a systematic review of the literature. Ann Saudi Med 31: 407-416.https://doi.org/10.4103/0256-4947.83204

6. Qureshi AZ, Ullah S, Ullah R (2012) The trend of hospitalaccreditation in the kingdom of Saudi Arabia. Saudi Med J 33:1350-1351.

7. Alotaibi YK, Federico F (2017) The impact of health information technology on patient safety. Saudi Med J 38: 1173.https://dx.doi.org/10.15537/smj.2017.12.20631

8. Kim JK, Dotson B, Thomas S, Nelson KC (2012) Standardized patient identification and specimen labeling: A retrospective analysis on improving patient safety. J Am Acad Dermatol 68: 53-56.https://doi.org/10.1016/j.jaad.2012.06.017

9. Walz SE, Darcy TP (2013) Patient safety and post analytical error. Clin Lab Med 33: 193-194.https://doi.org/10.1016/j.cll.2012.10.001

10. World Health Organization (2017) Fact sheet: blood safety and availability, Switzerland.

11. The Joint Commission (2017) National Patient Safety Goals, United States.

12. Dey BJ, Bharti JN, Chakraborty M (2013) Laboratory turnaround time. Int J Health Sci Res 3: 82-84.

13. Varela B, Pacheco G (2018) Comprehensive evaluation of the internal and external quality control to redefine analytical quality goals. Biochem Med (Zagreb) 28: 020710. https://doi.org/10.11613/BM.2018.020710

14. Huang QH, Lin YC, Huang WS (2018) Reducing bloodculture contamination rates in the emergency department. Hu Li Za Zhi 65: 89-97.https://doi.org/10.6224/JN.201810_65(5).11

15. Gunpinar S, Centeno G (2015) Stochastic integer programming models for reducing wastages and shortages of blood products at hospitals. Comput Oper Res 54 :129-141. https://doi.org/10.1016/j.cor.2014.08.017

16. Rooper L, Carter J, Hargrove J, Hoffmann S, Riedel S (2016) Targeting rejection: analysis of specimen acceptability and rejection, and framework for identifying interventions in a single tertiary healthcare facility. J Clin Lab Anal 31: e22060.https://doi.org/10.1002/jcla.22060

17. Devkaran S, O'Farrell PN (2014) The impact of hospital accreditation on clinical documentation compliance: a life cycle explanation using interruptedtime series analysis. BMJ Open 4: e005240.http://dx.doi.org/10.1136/bmjopen-2014-005240

18. Alonazi W (2013) Applying key performance indicators to evaluate health care service outcomes, Monash University, Australia.

19. Shaikh ZM, Al-Omari A, Ahmed A (2018) The impact of CBAHI accreditation on critical care unit outcome quality measures: a case study. Int JHealth Sci Res8: 394-407.