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Case Study

The Impact of CBAHI Accreditation on Critical Care Unit Outcome Quality Measures: A Case Study

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ABSTRACT

Quality indicators are the tools to measure the patient safety, effectiveness, equity, patient-centeredness, timeliness, and efficiency as defined by the Institute of Medicine (IOM). These measures are also categorized as structure, process and outcome by Dr. Avedis Donabedian.
Objectives: To study the impact of the Central Board for Accreditation of Healthcare Institutions (CBAHI) Accreditation on the outcome measures of critical care units in a tertiary care hospital.
Methods: This is a library research methodology, in which the analysis of historical records and data was done before and after the CBAHI Accreditation.
Significance of Research: It was observed during pre CBAHI Accreditation (from May 2016 to October 2016) and post CBAHI Accreditation (November 2016 to April 2017) that there was no significant improvement in the outcome measures of Critical Care Units.
Hypothesis: Null Hypothesis (Ho) and Alternative Hypothesis (H1) were used and tested to compare the pre CBAHI and post CBHAI impact.
Study Design: Outcome Quality Measures as per CBAHI Standards were monitored in pre and post CABHI Accreditation and were compared statistically to study the impact of CBAHI Accreditation. **Study Population**: The Outcome Quality Measures for the Critical Care Units as per the CBAHI Standards third edition were monitored from May 2016 to October 2016 (before CBAHI Accreditation) and from November 2016 to April 2017 (after CBAHI Accreditation)
Data Collections: Primary data were collected from all Critical Care Units before and after CBAHI Accreditation. Secondary data were collected from relevant published journals, articles, research papers, academic literature and web portals.
Conclusion: There was no statistically significant difference between pre-test and post-test results. Although a number of rates significantly differed across units. Those rates were namely mortality rate, DAMA rate, return to the critical care unit within 48 hours of discharge/transfer rate, average length of stay, rate of initial physical assessment done by nurses with acceptable time, patient identification compliance rate and hospital acquired

pressure ulcer (HAPU) rate. Hence, Null Hypothesis (Ho) is accepted and Alternative Hypothesis (H1) is rejected.

Key words: Central Board for Accreditation of Healthcare Institutions (CBAHI), Quality Indicators, Critical Care Units, Joint Commission International (JCI) Accreditation

INTRODUCTION

The Saudi Central Board for Accreditation of Healthcare Institutions (CBAHI) is the official agency authorized to grant accreditation certificates to all governmental and private healthcare facilities operating today in Saudi Arabia. CBAHI has emerged from the Saudi Health Council as a non-profit organization. The principal function of CBAHI is to set the healthcare quality and patient safety standards against which all healthcare facilities are evaluated for evidence of compliance.

The foundation of CBAHI dates back to 2001 as Makkah Region Quality Program (MRQP), an initiative aimed at improving quality of healthcare delivery in the Makkah Region. In 2005, under a Ministerial Order, MRQP was developed and named as Central Board for Accreditation of Healthcare Institutions (CBAHI) and its jurisdiction was expanded to the whole country. In 2006, with the help of healthcare quality experts from the public and private sectors, CBAHI developed the first set of national standards for hospitals. In 2012, CBAHI's 2nd edition of national standards for hospitals was certified by the International Society for Quality in Healthcare (ISQua). In late 2013, when a Cabinet of Ministers Decree called for changing CBAHI's official name to the "Saudi Central Board for Accreditation of Healthcare Institutions", it also mandated the national accreditation by CBAHI on all healthcare facilities. In addition, the Ministry of Health is mandated CBAHI accreditation as a prerequisite for renewal of the operating license – a step towards encouraging more participation in this ambitious national initiative. It is mandatory for all public and private health care delivery facilities (hospitals, polyclinics, blood banks and medical laboratories) in Saudi Arabia to comply with national standards set by CBAHI and obtain its accreditation through a survey process set forth by the Center.

The Essential National Requirements for Patient Safety (ESR) is a list of 20 national standards for hospitals. They are deemed to be basic conditions that must be fully observed to ensure patient safety and protection against health care related errors (CBAHI, 2017). [1]

REVIEW OF LITERATURE

The increased international focus on improving patient outcomes, safety and quality of care has led stakeholders, policy makers and health care provider organizations adopt standardized processes for measuring health care systems.

Based on the Institute of Medicine (IOM, 1990) definition of quality of care as "the degree to which health care services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge," [2] a quality indicator is a tool that enables the user to quantify the quality of a selected aspect of care by comparing it with a criterion (NQMC, 2013). [3]

Intensive-Care Units (ICUs) are the most expensive part of a hospital. It is therefore extremely important that they are used in the most efficient way. As in any other business, high quality and cost-effective performance in Intensive-Care Medicine (ICM) can best be achieved when responsibility and management are given to those who have the special expertise.

In the past decade, it has become evident that a greater input of intensivists leads to better outcomes for patients and more efficient resource use. This became obvious from a discussion in the United States of America (USA), where ICU

structures differ greatly from those in Western Europe. In the USA, most ICUs are so-called 'open' units, in which critically ill patients in the ICU are cared for by their primary physicians, who are not specialists in ICM. In contrast, a 'closed' unit is one in which a full-time intensivists (or a team of intensivists) provides ICM. Closed ICUs predominate in Western Europe. Now there seems to be an increasing awareness in the USA that the closed ICU may be more efficient (Hilmar Burchardi, Onnen Moerer, 2001). [4] There are statistically significant effects (all improvements) associated with accreditation with reduction in return to the Intensive Care Unit (ICU) within 24 hours of ICU discharge; reduction in staff turnover; and completeness of medical records. The net impact of accreditation was a 1.2 percentage point reduction in patients who returned to the ICU, 12.8% reduction in annual staff turnover and 20.0% improvement in the completeness of medical records. Pooling both hospitals over 3 years, these improvements translated into the total savings of US$ 593 000 in Jordan's healthcare system (Y.A. Halasa, W. Zeng, E. Chappy and D.S. Shepard, 2015). [5]

In the recent studies, the researchers have proved that there is a positive impact of health care accreditation on the health care services. The accreditation has a positive impact on the satisfaction of Physiotherapy Department (Shaikh, 2017), [6] Pharmacy Department Service (Shaikh, 2017), [7] Dietary Department Services (Shaikh, 2017), [8] Laboratory Department Services (Shaikh, 2017), [9] Emergency Department Services (Shaikh, 2017), [10] Out-Patient Department Services (Shaikh, 2018), [11] In-Patient Department Services (Shaikh, 2017), [12] Haemodialysis Department Services (Shaikh, 2017), [13] Radiology Department Services (Shaikh, 2017), [14] Ambulance Services (Shaikh, 2016), [15] and also has positive impact on the Occurrence Variance Reports (Shaikh 2018), [16] completeness of personnel files in Human Resource Department (Shaikh 2017). [17] A comparative study of laboratory and blood bank performance by using the quality indicators revealed that the mean rating of the second half (after the accreditation) is better than the mean rating of the first half (before accreditation) (Shaikh, 2018). [18]

The researchers have compared the healthcare accreditation standards and revealed that there are variations among them despite of being accredited by the International Society for Quality in Health Care (ISQua). The critical analysis of Patient and Family Rights (PFR) standards (Shaikh, 2017), [19] Patient and Family Education (PFE) standards (Shaikh, Al-Towyan & Khan, 2016) [20] and International Patient Safety Goals (IPSG) standards (Shaikh, Al-Towyan & Khan, 2016) [21] in the Joint Commission International (JCI) Accreditation and Central Board for Accreditation of Healthcare Institutes (CBAHI) standards for hospitals clearly show that the PFR and PFE standards are very comprehensive than the JCI Accreditation standards whereas the IPSG standards in JCI Accreditation are much comprehensive than CBAHI Standards. The critical analysis of Staff Qualifications and Education (SQE) standards in JCI Accreditation and Medical Staff (MS) & Staffing Management (SM) standards in Det Norske Veritas (DNV) Accreditation for hospitals clearly shows that the SQE Standards in JCI Accreditation are very comprehensive than the DNV's National Integrated Accreditation for Healthcare Organizations (NIAHO) Accreditation (Shaikh, Al-Towyan & Khan, 2016). [22]

DATA ANALYSIS:

1.1 Descriptive statistics of the various rates

The following table represents the pre-test, post-test and overall means and their standard deviation.

Table1. Descriptive statistics of the rates

Sr.No.	Type	Pre-test		Post-test		Total		N
		M	SD	M	SD	M	SD	
1	Mortality Rate	2.95	3.11	3.70	3.92	3.33	3.52	24
2	Discharge Against Medical Advise (DAMA) Rate	8.87	4.65	6.88	3.43	7.87	4.16	24
3	Re-Intubation within 48 Hours Post Extubation Rate	1.58	2.77	3.89	7.49	2.73	5.71	24
4	Return to the critical care unit within 48 Hours of Discharge/Transfer Rate	1.12	2.23	1.04	1.30	1.08	1.80	24
5	Average Length of Stay	5.72	3.65	5.48	3.82	5.60	3.70	24
6	Rate of Initial Physical Assessment done by Nurses with Acceptable Time	96.33	3.95	97.51	2.63	96.92	3.37	24
7	Patient Falls Rate	0.00	0.00	0.00	0.00	0.00	0.00	18
8	Patient Fall with Injury Rate	0.00	0.00	0.00	0.00	0.00	0.00	18
9	High Alert Medication Compliance Rate	99.63	1.55	100.00	0.00	99.81	1.10	24
10	Patient Identification Compliance Rate	99.69	1.08	99.82	0.53	99.75	0.84	24
11	Ventilator Associated Pneumonia (VAP) Rate	1.44	2.64	1.99	4.74	1.71	3.79	18
12	Catheter Associated Urinary Tract Infection (CAUTI) Rate	2.35	9.03	0.59	1.94	1.47	6.50	18
13	Central Line Associated Blood Stream Infection (CLABSI) Rate	5.80	11.96	3.64	5.85	4.72	9.35	18
14	Hospital Acquired Pressure Ulcer (HAPU) Rate	0.90	1.11	0.74	1.11	0.82	1.09	12
	Total	27.87	40.38	27.94	40.54	27.91	40.43	318

1.2 Pre, post-test and across units differences

1.2.1 Mortality Rate

To identify whether the mortality rate differed at pre-test and post-test stages and in various units (ICU, CCU, PICU and NICU)a two-way ANOVA was carried out. The results indicated that mortality rate differed across the units ($F_{3, 40}$= 17.455, p = 0.000). However there was no significant difference between pre-test and post-test mortality rates ($F_{1, 40}$ = 1.082, p = 0.304).

Table2. Two-way ANOVA results of the Mortality rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	333.986[a]	7	47.712	7.685	.000	.574
Intercept	531.735	1	531.735	85.651	.000	.682
Unit	325.094	3	108.365	17.455	.000	.567
Test	6.720	1	6.720	1.082	.304	.026
Unit * Test	2.171	3	.724	.117	.950	.009
Error	248.327	40	6.208			
Total	1114.047	48				
Corrected Total	582.312	47				

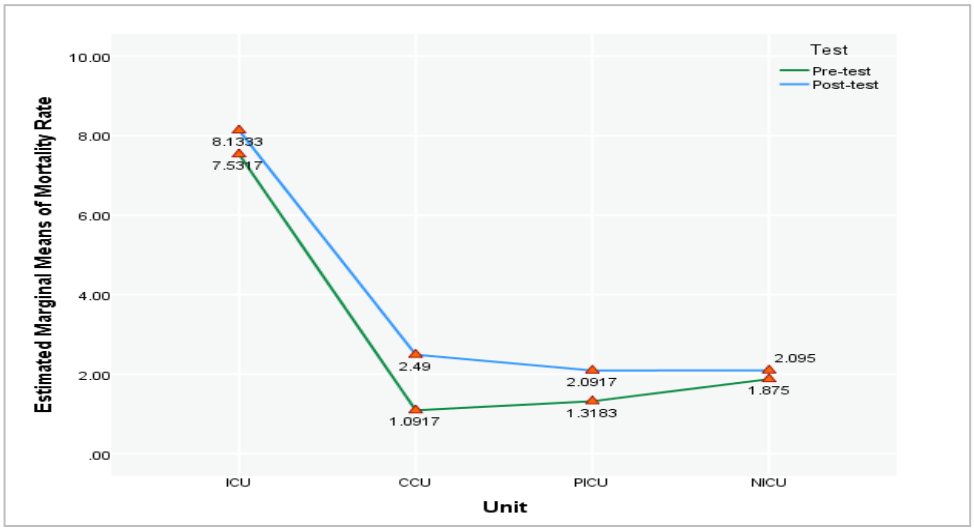

Figure1. Mean plot of mortality rates in various units and at pre, post-test stages

As in the following figure, ICU had the highest pre-test (7.53 ± 1.77) and post-test (8.13 ± 4.61) mean mortality rates. Lowest mean was reported by two different units where at the pre-test stage it was reported by the CCU (1.09 ± .91) and PICU (2.09 ± 1.36) at the post-test stage. These

statistics provide further evidence for the fact that mortality rate differs across units.

Figure 1 also providesgraphical interpretation to why there wasn't a significant difference in the pre-test and post-test mortality rate where at each unit pre-test means were closely followed by the post-test mean mortality rates. Hence the pre-test and post-test mortality rates were statistically equal.

1.2.2 Discharge against Medical Advise (DAMA) Rate

DAMA rate had the same characteristics when it comes to difference at pre-test, post-test stages and difference between units where DAMA rate differed between units ($F_{3, 40}$ = 5.396,p = .003) and not differed between tests ($F_{1, 40}$ = 3.638,p = .064). The interaction was not significant either ($F_{3, 40}$ = .761, p = .522).

Table3. Two-way MANOVA results of the interaction differences in DAMA rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	290.245[a]	7	41.464	3.159	.009	.356
Intercept	2975.490	1	2975.490	226.676	.000	.850
Unit	212.505	3	70.835	5.396	.003	.288
Test	47.760	1	47.760	3.638	.064	.083
Unit * Test	29.980	3	9.993	.761	.522	.054
Error	525.064	40	13.127			
Total	3790.799	48				
Corrected Total	815.309	47				

Two-way ANOVA indicated that pre-test and post-test DAMA rates did not differ significantly. Though the Figure shows some sort of a difference in the pre-test and post-test DAMA rates across four units, overall mean of pre-test DAMA rate(M = 8.8708 ±4.64561) and post-test DAMA rate (M = 6.8758 ± 3.43366) had no statistically significant difference. Due to that pre-test and post-test DAMA rate means can be considered as statistically equal

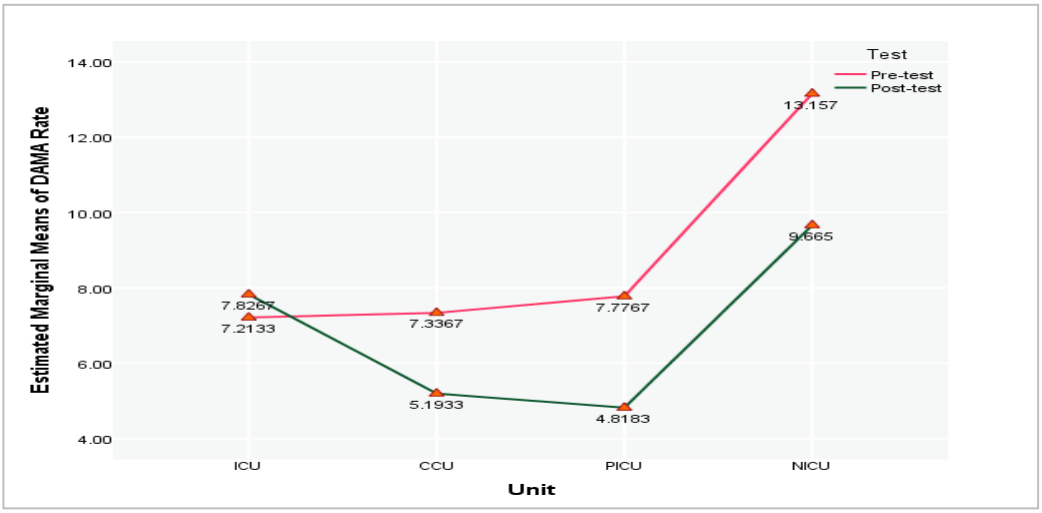

Figure2. Mean plot of DAMA rates in various units and at pre and post-test stages

Re-Intubation within 48 Hours Post-Extubation Rate

Though the Mortality and DAMA rate differed at least across units, the re-intubation within 48 hours post-extubation rate didn't differ at least in that aspect ($F_{3, 40}$ = .827, p = .487). Also the interaction of unit and the test was not significant either ($F_{3, 40}$ = .739, p = .535). Hence the re-intubation within 48 hours post-extubation rate can be considered as equal between pre and post-test and across four units. This is mainly due to the fact that in most of the data sample units, rate value was zero, hence the mean was affected by large a standard deviation.

Table4. Two-way ANOVA results of Re-Intubation within 48 Hours Post Extubation Rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	218.550[a]	7	31.221	.950	.480	.143
Intercept	358.723	1	358.723	10.920	.002	.214
Test	64.218	1	64.218	1.955	.170	.047
Unit	81.486	3	27.162	.827	.487	.058
Test * Unit	72.846	3	24.282	.739	.535	.053
Error	1313.968	40	32.849			
Total	1891.241	48				
Corrected Total	1532.518	47				

Following figure further proves the fact that there was a considerable number of sample units were their rate was equaled to zero. Hence at the pre-test stage two units namely CCU and PICU had a mean of zero, which may guide to insignificant test results.

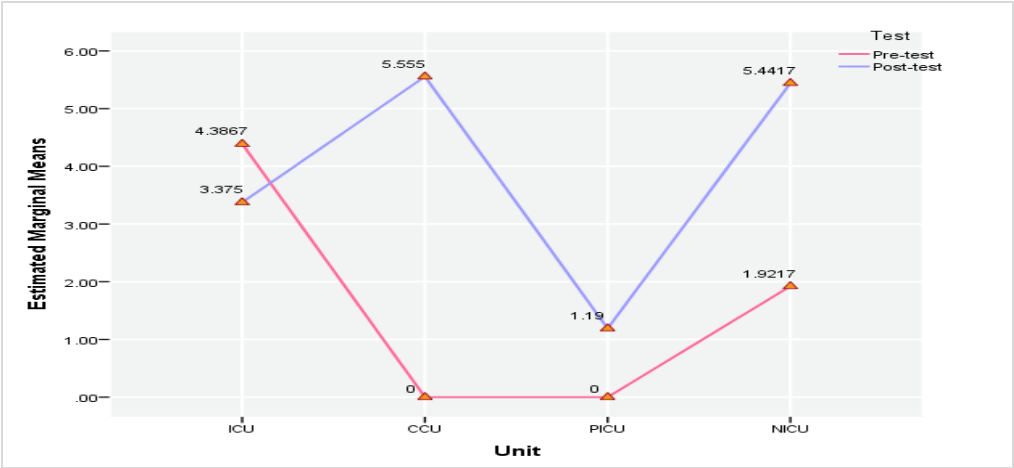

Figure3. Mean plot of Re-Intubation within 48 Hours Post Extubation Rate

1.2.3 Return to the critical care unit within 48 Hours of Discharge/Transfer Rate

Return to the critical care unit within 48 hours of discharge/transfer rate was differed across the four units ($F_{3, 40} = 4.555 \pm p = .008$) here. Yet the difference of the rate between pre-test and post-test was not significant ($F_{1, 40} = .028 \pm p = .867$.)Which indicated that return to the critical care unit within 48 hours of discharge/transfer rate was statistically equal between the pre-test and post-test.

Table5. Two-way ANOVA results of the return to the critical care unit within 48 hours of discharge/transfer rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	45.481[a]	7	6.497	2.416	.037	.297
Intercept	55.492	1	55.492	20.630	.000	.340
Unit	36.760	3	12.253	4.555	.008	.255
Test	.076	1	.076	.028	.867	.001
Unit * Test	8.645	3	2.882	1.071	.372	.074
Error	107.593	40	2.690			
Total	208.566	48				
Corrected Total	153.074	47				

1.2.4 Average Length of Stay

As most of the other rates, the average length of stay only differed across units ($F_{3, 40} = 41.866$, $p = .000$). The interaction of the two factors namely unit and the test was not significant ($F_{3, 40} = 1.166$, $p = .335$). Which indicated that average length of stay was not affected by both the test and unit at once.

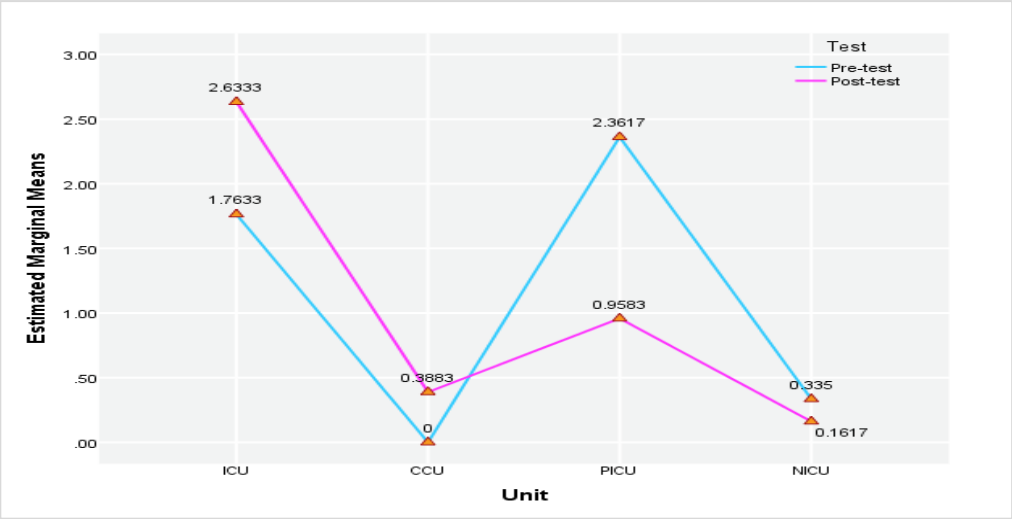

Figure4. Mean plot of return to the critical care unit within 48 hours of discharge/transfer rate

Table6. Two-way ANOVA results of the average length of stay

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	490.727[a]	7	70.104	18.467	.000	.764
Intercept	1505.056	1	1505.056	396.461	.000	.908
Unit	476.794	3	158.931	41.866	.000	.758
Test	.658	1	.658	.173	.679	.004
Unit * Test	13.274	3	4.425	1.166	.335	.080
Error	151.849	40	3.796			
Total	2147.632	48				
Corrected Total	642.576	47				

Both the pre-test and post-test means were close to each other at each unit, for example, thedifference between ICU and CCU post-test and pre-test means were lower than 1. As a result pre-test and post-test means were not significantly differed and can be considered statistically equal.

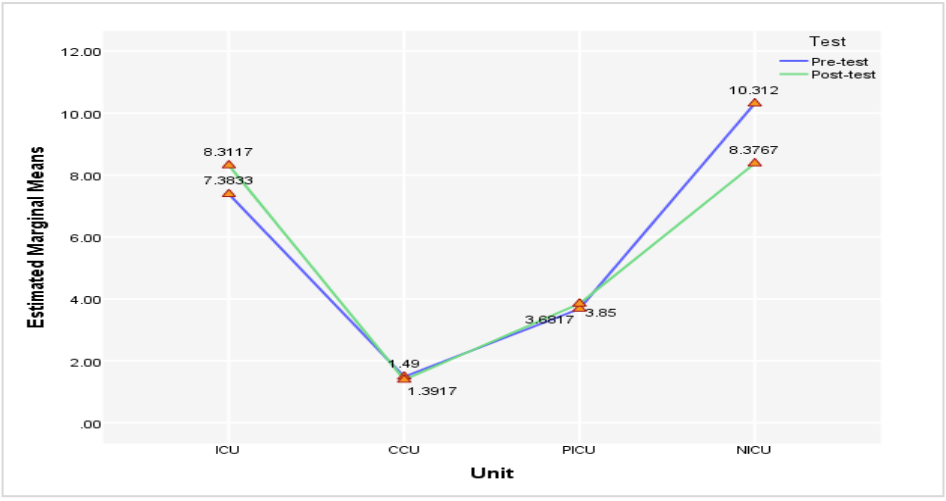

Figure5. Mean plot of average length of stay

1.2.5 Rate of Initial Physical Assessment done by Nurses with Acceptable Time

As most of the other rates, the rate of initial physical assessment done by nurses with acceptable time differeda cross units ($F_{3, 40}$ = 13.373, p = .000). The interaction of the two factors namely unit and the test was not significant ($F_{3, 40}$= 1.123, p = .351). in other words mean rate of initial physical

assessment done by nurses with acceptable time was different across units but it was equal between pre-test and post-test.

Table7. Two-way ANOVA results of the rate of initial physical assessment done by nurses with acceptable time

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	286.483[a]	7	40.926	6.600	.000	.536
Intercept	450910.608	1	450910.608	72712.232	.000	.999
Unit	248.782	3	82.927	13.373	.000	.501
Test	16.803	1	16.803	2.710	.108	.063
Unit * Test	20.897	3	6.966	1.123	.351	.078
Error	248.052	40	6.201			
Total	451445.143	48				
Corrected Total	534.535	47				

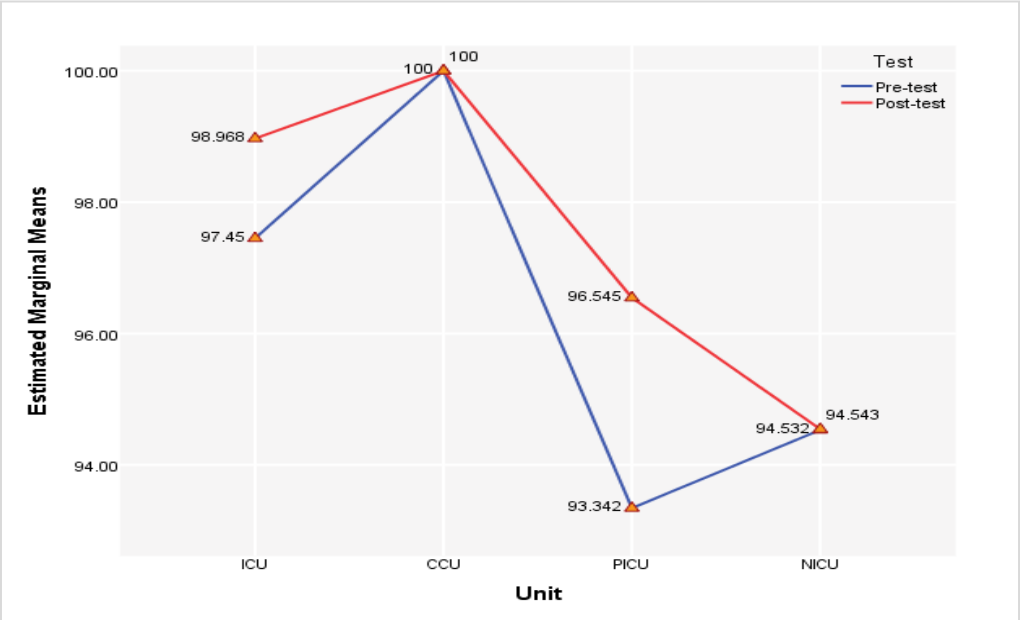

Figure6. Mean plot of the rate of initial physical assessment done by nurses with acceptable time

1.2.6 Patient Falls Rate

Can't compare rates due to the fact that all the values were zero.

1.2.7 Patient Fall with Injury Rate

Can't compare rates due to the fact that all the values were zero.

1.2.8 High Alert Medication Compliance Rate

High alert medication compliance rate wasn't significantly differed between pre-test and post-test ($F_{1,\ 40}$ = 1.470,p = .232), across the four units ($F_{3,\ 40}$ = 1.470 p = .237). Considering the interaction there was no significance either ($F_{3,\ 40}$ = 1.470 p = .237). These statistics indicated that high alert medication compliance rate is completely independents from the tests and four units.

Table8. Two-way ANOVA results of the high alert medication compliance rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	11.577[a]	7	1.654	1.470	.206	.205
Intercept	478219.654	1	478219.654	425020.384	.000	1.000
Test	1.654	1	1.654	1.470	.232	.035
Unit	4.962	3	1.654	1.470	.237	.099
Test * Unit	4.962	3	1.654	1.470	.237	.099
Error	45.007	40	1.125			
Total	478276.238	48				
Corrected Total	56.584	47				

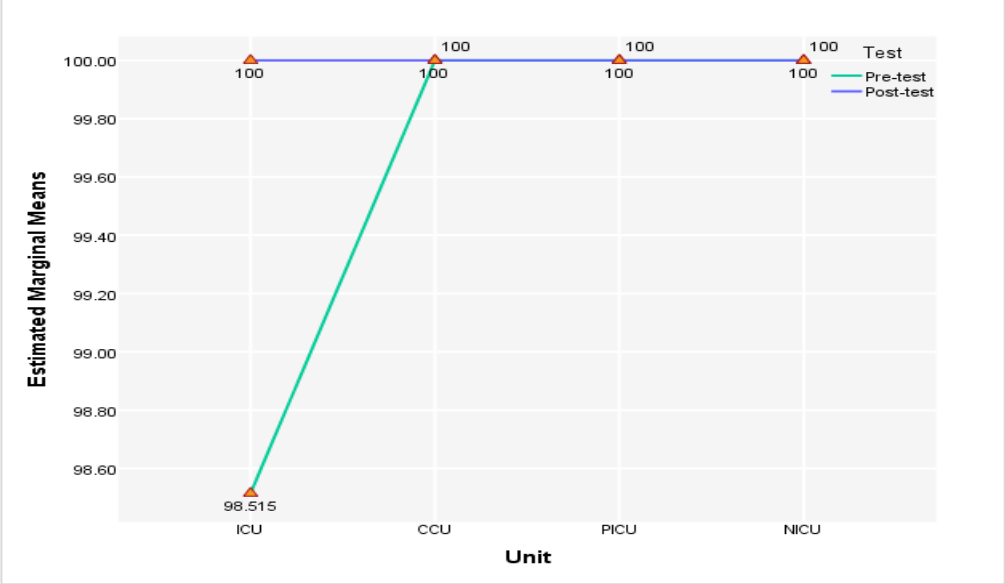

Figure7. Mean plot of the rate of high alert medication compliance rate

1.2.9 Patient Identification Compliance Rate

Unsurprisingly the patient identification compliance rate was also differed across four units ($F_{3, 40}$ = 5.012,p = .005). As most of the other rates, this rate was also not differed in the pre-test and post-test stage ($F_{1, 40}$= .370, p = .775.). Which indicated that patient identification compliance rate wasn't affected by the program carried out.

Table9. Two-way ANOVA results of the patient identification compliance rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	9.705[a]	7	1.386	2.360	.041	.292
Intercept	477624.945	1	477624.945	812844.309	.000	1.000
Test	.217	1	.217	.370	.546	.009
Unit	8.836	3	2.945	5.012	.005	.273
Test * Unit	.652	3	.217	.370	.775	.027
Error	23.504	40	.588			
Total	477658.154	48				
Corrected Total	33.209	47				

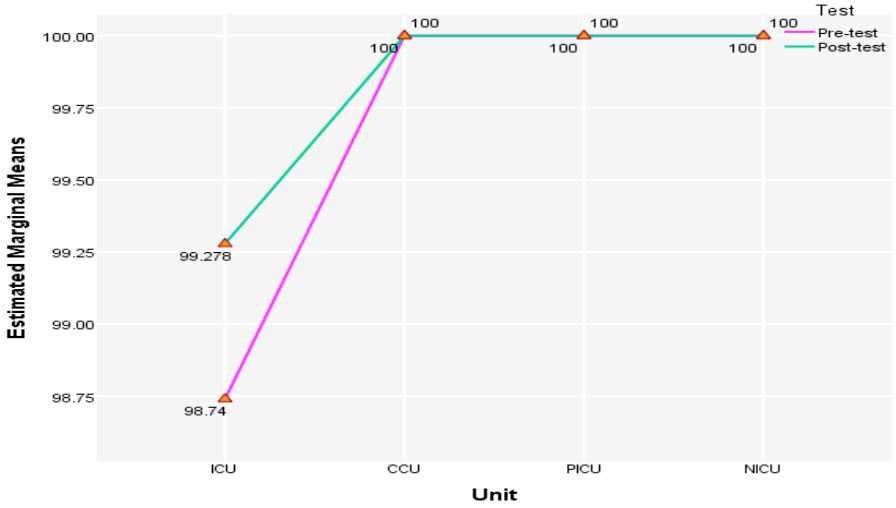

Figure8. Mean plot of patient identification compliance rate

1.2.10 Ventilator Associated Pneumonia (VAP) Rate

Surprisingly the interaction of test and unit significantly affected the VAP rate ($F_{2, 30}$ = 3.794, p = .034). Yet when the unit ($F_{2, 30}$= 2.271, p = .121) and the test ($F_{2, 30}$ = .230, p = .635) considered individually they didn't affected the VAP rate significantly.

Table10. Two-way ANOVA results of the Ventilator Associated Pneumonia (VAP) Rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	147.024[a]	5	29.405	2.472	.055	.292
Intercept	105.507	1	105.507	8.870	.006	.228
Test	2.739	1	2.739	.230	.635	.008
Unit	54.019	2	27.009	2.271	.121	.131
Test * Unit	90.266	2	45.133	3.794	.034	.202
Error	356.851	30	11.895			
Total	609.381	36				
Corrected Total	503.874	35				

The main reason behind the insignificant pre-test and post-test VAP rate differences was a large number of sample units in the sample had a value of zero. As in the following figure at the pre-test stage, CCU and PICU had mean VAP rate of zero which means at those stages those units did not record a VAP rate value, thesame characteristic can be seen in CCU at the post-test stage as well. Hence the pre-test and post-test means were not significantly differed from each other.

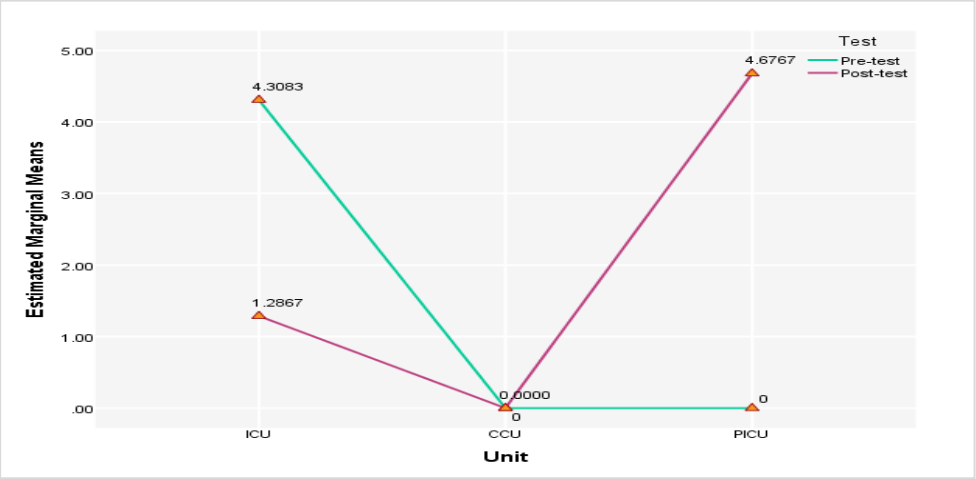

Figure9. Mean plot of VAP rate

1.2.11 Catheter Associated Urinary Tract Infection (CAUTI) Rate

From the sample units (36 sample units) collected regarding CAUTI rate, 86.1% (31 sample units) were equaled to zero. Only 5 sample units had some sort of a positive value. Hence the conducted two-way ANOVA was insignificant; interaction ($F_{2, 30}$ = 1.159, p = .328), unit ($F_{2, 30}$ = .645, p = .428), test ($F_{1, 30}$ = .645, p = .428).

Table11. Two-way ANOVA results of the CAUTI rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	190.132[a]	5	38.026	.885	.503	.129
Intercept	77.704	1	77.704	1.809	.189	.057
Test	27.685	1	27.685	.645	.428	.021
Unit	62.912	2	31.456	.732	.489	.047
Test * Unit	99.535	2	49.768	1.159	.328	.072
Error	1288.673	30	42.956			
Total	1556.510	36				
Corrected Total	1478.806	35				

A large number of zero values have also affected the estimated marginal means as well. Figure 11shows those effected marginal means where there mean values were lower than zero (negative).

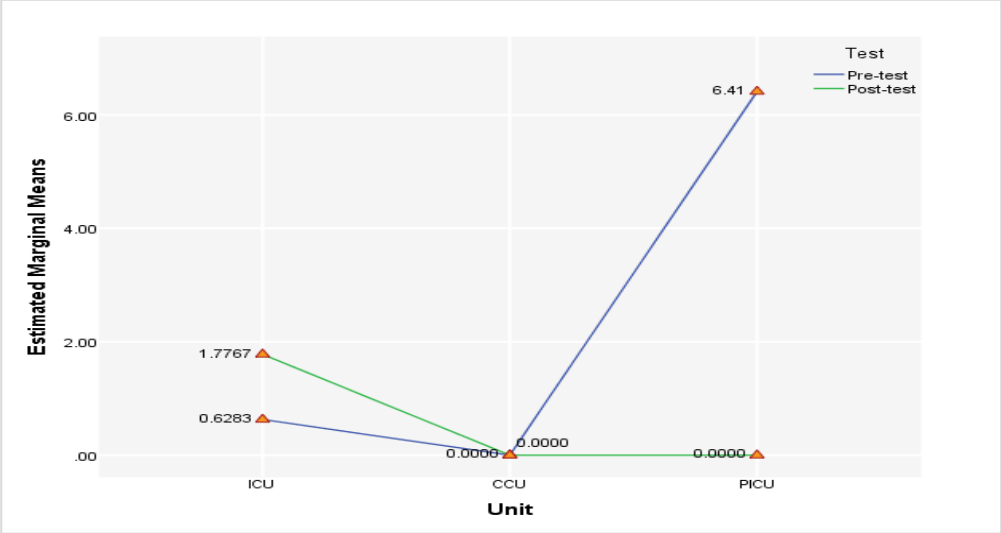

Figure10. Mean plot of CAUTI rate

1.2.12 Central Line Associated Blood Stream Infection (CLABSI) Rate

CLABSI rate and unit had no significant interaction ($F_{2, 30}$ = 3.758, p = .035), or individual effect; unit ($F_{2, 30}$ = 3.043, p = .063) and test ($F_{1, 30}$ = .609, p = .441). This is also mainly due to the fact that sample had a large proportion of zero values. In this case, 66.7% (24 units from 36) of the sample units were zeros. As a result, the results were insignificant in every possible way.

Table12. Two-way ANOVA results of the CLABSI rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	982.668[a]	5	196.534	2.842	.032	.321
Intercept	802.589	1	802.589	11.607	.002	.279
Test	42.120	1	42.120	.609	.441	.020
Unit	420.807	2	210.403	3.043	.063	.169
Test * Unit	519.742	2	259.871	3.758	.035	.200
Error	2074.417	30	69.147			
Total	3859.674	36				
Corrected Total	3057.085	35				

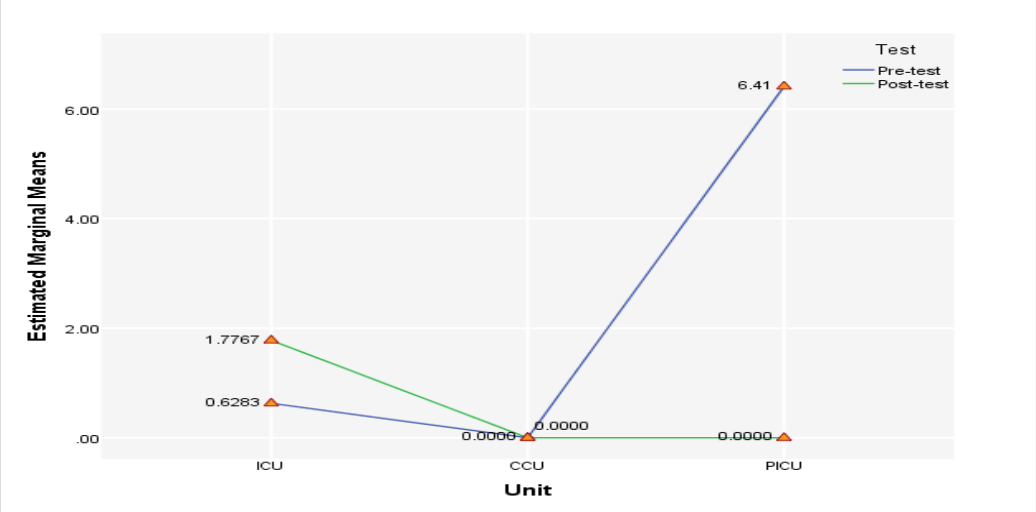

Figure11. Mean plot of CLABSI rate

1.2.13 Hospital Acquired Pressure Ulcer (HAPU) Rate

Though the interaction was insignificant ($F_{1, 20}$ = .010, p = .923) individually two units which taken in to consideration significantly differed in HAPU rate ($F_{1, 20}$ = 17.301, p = .000). However pre-test and post-test results were not significantly differed from each other ($F_{1, 20}$ = .218, p = .646). So the HAPU rate had the characteristic which most of the other rates had where it differed across units but stayed same at the pre-test and post-test stages.

Table13. Two-way ANOVA results of the Hospital-Acquired Pressure Ulcer (HAPU) Rate

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	12.737[a]	3	4.246	5.843	.005	.467
Intercept	16.220	1	16.220	22.322	.000	.527
Test	.158	1	.158	.218	.646	.011
Unit	12.572	1	12.572	17.301	.000	.464
Test * Unit	.007	1	.007	.010	.923	.000
Error	14.532	20	.727			
Total	43.489	24				
Corrected Total	27.269	23				

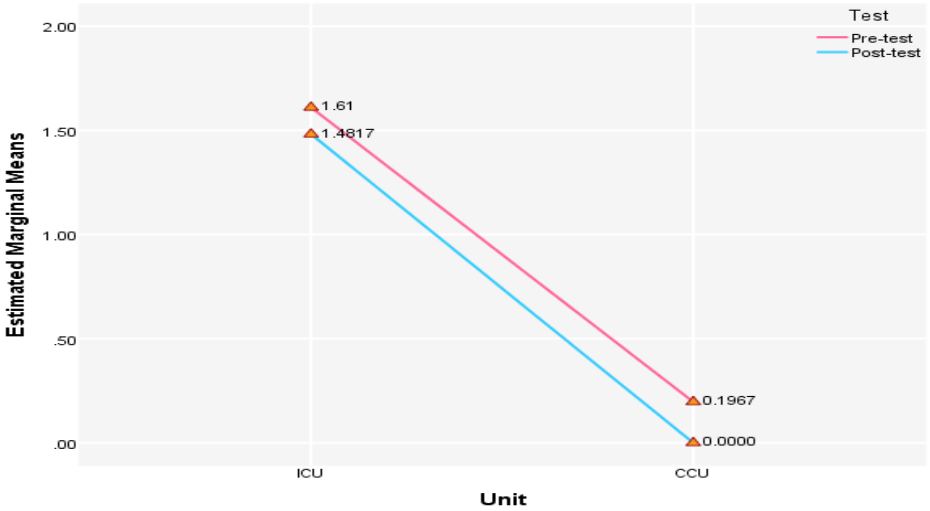

Figure12. Mean plot of HAPU rate

1.3 Overall interaction

A two-way ANOVA was conducted to identify the overall mean differences between units (ICU, CCU, etc.) and tests (pre-test and post-test).There was statistically insignificant two-way interaction between tests and units;$F_{3, 628}$ = .013, p = .998.Howeverrates were significantly differed across units, $F_{3, 628}$ = 4.818, p = .003.

Table14. Two-way ANOVA results of the overall interaction

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	23411.066[a]	7	3344.438	2.070	.045	.023
Intercept	517400.405	1	517400.405	320.258	.000	.338
Test	.486	1	.486	.000	.986	.000
Unit	23349.340	3	7783.113	4.818	.003	.022
Test * Unit	60.888	3	20.296	.013	.998	.000
Error	1014581.148	628	1615.575			
Total	1533261.874	636				
Corrected Total	1037992.214	635				

CONCLUSION

In conclusion there was no statistically significant difference between pre-test and post-test results. Although a number of rates significantly differed across units. Those rates were namely mortality

rate, DAMA rate, return to the critical care unit within 48 hours of discharge/transfer rate, occupancy rate, average length of stay, rate of initial physical assessment done by nurses with acceptable time, patient identification compliance rate and hospital acquired pressure ulcer (HAPU) rate. Hence, Null Hypothesis (Ho) is accepted and Alternative Hypothesis (H1) is rejected.

LIMITATIONS OF THE STUDY:

This study is limited to the study hospital (Joint Commission International and HIMSS-6 accredited) and for a limited period from May 2016 to April 2017 only.

DIRECTIONS FOR FUTURE RESEARCH:

In future such research should be conducted to study the overall impact of national accreditation on other departments of the hospital.

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The study hospital is a private, tertiary care hospital with 315 in-patient beds and has JCI, HIMSS-6 accreditations.

DISCLAIMER

This publication contains information obtained from authentic and highly regarded sources. Reasonable effort has been made to publish reliable data and information, but the author and the publisher cannot assume responsibility for the validity of all materials or for the consequences of the use.

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