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The Effect of 5S on Employee Performance: An Empirical Study among Lebanese Hospitals

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Abstract

When studying the regular quality practices in hospitals, it is essential to focus on the 5S as it reflects the daily activities of healthcare providers. The aim of this research is to study the effect of 5S-quality approach on employee performance in some Lebanese hospitals. Based on a quantitative approach, a survey was conducted among four hospitals in South Lebanon and 240 self-administered questionnaires were distributed randomly among target respondents. The collected primary data was analyzed by SPSS software. Statistical tests were applied for hypothesis testing such as correlation and regression analysis tests. The obtained results showed that 5S is significantly and positively affecting employee performance except for Sort. This study was limited to the constricted geographical zone and small number of hospitals was surveyed. Future studies may enlarge the research empirically and study different quality approaches.

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INTRODUCTION

Quality improvement is considered as "strategic tool for organizations that seek sustainability, productivity and advanced performance" (El-Sherbiny et al., 2017). Diverse quality approaches were discussed previously and 5S is an influential technique in strengthening the organizational goals for continuous improvement. By definition, 5S system is "a technique which maintains the quality of working environment in the association and it is originated from five Japanese words known as Seiri, Seiton, Seiso, Seiketsu and Shitsuke" (Ho et al., 1995; Gapp et al., 2008; HungLing, 2011). These quality improvements require empowerment of employees to achieve the organizational objectives. In addition, measuring the employee performance continuously is essential to control the quality of procedures inside the organization (Younis, 2017).

Mainly, employee performance is greatly appreciated in the healthcare sector. Aoun et al., (2018) state that "hospitals are dynamic organizations that are getting more involved in implementing quality approaches to be accredited by the authorized parties and to better compete in the healthcare industry. Hospitals have to concentrate more on their employees' transformation skills and appropriately invest so they can successfully innovate through applying and adopting different improvement strategies such like lean practices and soft total quality management". Several studies have been previously conducted to examine the relation between diverse quality methodologies and employee performance between different sectors. Yet, there is lack of literature that reports the implementation of these approaches in the Lebanese healthcare sector. Although 5S is directly associated to the employees' daily actions , there is no focus on how to improve these operations. Therefore, the first objective of this study is to "determine to which extent 5S is implemented in the Lebanese hospitals" and the second objective is to study "the effect of 5S on employee performance in these hospitals" as shown in figure 1.

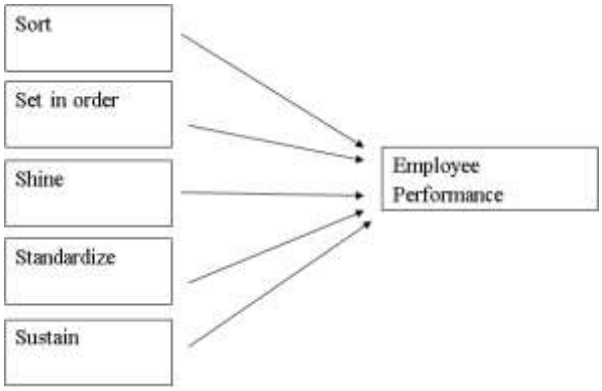

Figure 1. Research Framework

Healthcare Sector in Lebanon

According to MOPH statistical bulletin (2017), there is total of 147 hospitals in Lebanon (117 private and 30 public). Noticeably, the Lebanese healthcare sector has shown high commitment to quality standards. Based on the strict policies of MOPH, all Lebanese hospitals are being periodically accredited to maintain high level of performance and to ensure safe healthcare services to customers. Hospitals have developed sets of key performance indicators (KPI) to monitor the quality of healthcare services in terms of "employee's satisfaction, customer satisfaction, cost reduction and financial benefits" (Sabry, 2014).

LITERATURE REVIEW

The 5S-Quality Approach

By definition, 5S is "a system of workplace that can be looked over as rules devised to create a safe and productive work environment and to provide efficient and effective realization of business tasks" (John, 2015). As described in figure 2, The American Society for Quality (ASQ, 2018) defined "the five Japanese words to sort, set in order, shine, standardize and sustain".

Employee's performance

Employee performance is defined as "the overall expected value from employees' behaviors fulfilled over the course of a set period of time" (Motowidlo, Borman, & Schmidt, 1997). According to Oppler (2019), employee performance "assesses whether a person performs a job well and it is an important criterion for organizational aftermath and success". Moreover,

employee performance is categorized into "task performance and contextual performance". Task performance refers "to direct transformation of raw materials to goods and services which are typically included in job descriptions". As for the contextual performance, it refers to "the contribution of behaviors to the overall effectiveness as it supports the psychological and the social climate where work is done" (Borman & Motowidlo, 1993).

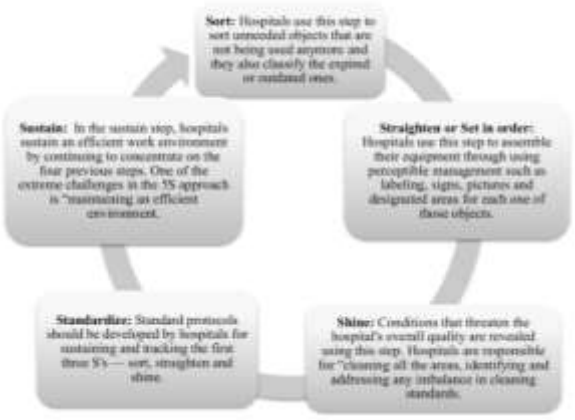

Figure 2. Description of 5S

Previous Studies

Generally, previous studies have measured the correlation between different quality attitudes and employee performance. For example, Jiménez et al. (2015) considered "the effect of the 5S on quality, productivity and organizational climate in two manufacturing SME located in Usaquen; Bogotá". The results showed that "there was a boost in productivity (83% - 68%) and quality (36% - 67%) according to performance measurements as well as development of the organizational climate (18% - 33%)".

Similarly, a study conducted by El-Sherbiny et al. (2017) assessed "the operation of the 5S-Kaizen approach in developing the care arrangement quality in hospitals and gauge its effects on the job satisfaction of the healthcare jobholders". The results included "Patient-hospital cycle time was minimized by more than 50% after the implementation of the 5S-Kaizen approach. In addition to that, the healthcare professionals believe that they had saved time, money and efforts while decreasing their everyday workload and stress by the application of the 5S-Kaizen approach". Table 1 summarizes some of the practical outcomes that were addressed in literature review.

Table 1. Empirical Studies for Quality in Healthcare Sector

Organization	Study	Problem	Lean Tool	Results
1. NIDCG, hospital in UK: NHS	Papadopoulos (2011)	**Pathology Department:** High turnaround times for inpatient and outpatient test results. The variability in demand by hour. The insufficient handling of the arriving specimens.	SET VSM VM	Delays almost eliminated in specimen reception. Duplicate steps removed at labeling. Fewer staff required at labelling and booking-in. Staff movement is minimized. Extra space has been created in lab. Work is done in standard way. Work flow is more predictable and problems are immediately visible. Closure work areas and less chaos. Specimens arrive even three hours earlier.
2. Nationwide survey of 210 US hospitals.	Groves (2012)	To help reduce or eliminate sources of errors	5S Process mapping Value stream mapping Kaizen Just-in-time	Enhance patient safety. Enhance operational effectiveness. Enhance competitiveness.
3. Profit hospital with 230 bed	HPP (2012)	46% of nursing time was spent on tasks related to patient care while the remaining 54% was directed towards (unplanned) tasks and waste	Lean Workplace Redesign: (5S & Work standardization)	Standardized Patient Room Layout/Equipment. Patient Supplies Stocked at the Point of Use. 40% Overall Waste Reduction. 80% Increase in Care Related Activities. 27% Increase in Bedside Time. 12% Decrease in Wasted Motion.
4. Al-Jala hospital Libya	Erfan (2010)	**Emergency Department:** Overcrowding Shortage in hospital beds. High medical perception of patients. Shortage of examination space. Shortage of medical staff.	VSM	20.7% reduce in the lead time to provide the service at ED. 50%increase in the patients served capacity. 30% reduce in idle time. 31% increase in utilized time.

Respectively, the following proposed hypotheses are summarized in Table 1.

Table 2. Research Hypothesis

H_1	**There is a positive and significant relationship between 5S and employee performance.**
H_a	There is a positive and significant relationship between Sort and employee performance.
H_b	There is a positive and significant relationship between Straighten and employee performance.
H_c	There is a positive and significant relationship between Shine and employee performance.
H_d	There is a positive and significant relationship between Standardize and employee performance.
H_e	There is a positive and significant relationship between Sustain and employee performance.

METHODS

This study is based on a quantitative methodology. In South Lebanon, there are 16 hospitals (12 private and 4 public hospitals). For this survey, only four Hospitals agreed to participate. For each hospital, the human resource manager provided the necessary information as shown in table 3. The population of this study tis represented by the total number of employees (670 employees).

Table 3. Sample Frame of the Study

Hospital	Type	Total number of employees	Distributed questionnaires	Returned questionnaires
A	Public	330	60	25
B	Private	220	60	22
C	Private	250	60	21
D	Private	70	60	19
Total		670	240	87

Morgan (1970) suggested that the best sample size for population between 600 and 700 should be between 234 and 248. Therefore, the sample size was limited to 240 employees from the four hospitals. For data collection, self-administered questionnaires were randomly dispersed among target respondents during a short time horizon "April 2019 to May 2019". The questionnaire includes three sections as shown in the appendix. Items were measured using "Five Likert Scale (1-strongly disagree to 5-strongly agree)".

RESULTS AND DISCUSSION

Results of Descriptive Statistics

The descriptive statistics results show that the mean and standard deviation of 5S (3.87; 0.559) and employee performance (4.36; 0.495) reflects an agreement of respondents on the implementation of research variables. Table 4 summarizes the demographic results of this study.

Table 4. Demographic Results

Gender	Females: 48 employees Males: 39 employees
Age	45 employees (20-30 years) 30 employees (31-40 years) 7 employees (41-50 years) 5 employees (above 50 years)
Education	29 % BBA degree 20 % TS degree 15% High school 11% Masters' degree 3 % BSN 1 % MPH
Working period at current hospital	46% less than five years 25 % between 5 and 10 years 8 % between 11 and 15 years 5 % more than 20 years
Years of Experience	42 employees: less than five years 28 employees: between 5 and 10 years 11 employees: between 10 and 20 years 6 employees: above 20 years
Occupation	32 % Technician 22% Nurse 22% Administration positions 2% Physicians 2% Pharmacists 7% different categories

Testing Hypotheses

The result showed high level of consistency of the measure. For testing reliability, the results of cronbach's alpha are (employee performance, 0.777); (5S, 0.869) and the Cronbach alpha for all variables is (0.877). For correlation test, table 5 summarizes the obtained results where positive ($r=0.528>0.3$) and significant ($sig=0.000<0.005$) correlation exists between 5S and employee performance and therefore, H_1 is accepted.

Table 5. Total Correlation between Research Variables

Total Correlations

		Total5S	Total Emp Per
Total5S	Pearson Correlation	1	.528**
	Sig. (2-tailed)		.000
	N	87	87
Total Emp Per	Pearson Correlation	.528**	1
	Sig. (2-tailed)	.000	
	N	87	87

**. Correlation is significant at the 0.01 level (2-tailed).

As shown in Table 6, all obtained results are significantly and positively correlated with the exception of 5S1 and 5S2 ($p > 0.005$). Those items describe the fifth S "Sort". Hence, the proposed hypotheses were accepted but H_a was rejected.

Table 6. Detailed Results of Correlation Test

		Total Emp Per
Total Emp Per	Pearson Correlation	1
	Sig. (2-tailed)	
	N	87
S51	Pearson Correlation	.022
	Sig. (2-tailed)	.838
	N	87
S52	Pearson Correlation	.200
	Sig. (2-tailed)	.063
	N	87
S53	Pearson Correlation	.310**
	Sig. (2-tailed)	.003
	N	87
S54	Pearson Correlation	.301**
	Sig. (2-tailed)	.005
	N	87
S55	Pearson Correlation	.304**
	Sig. (2-tailed)	.004
	N	87
S56	Pearson Correlation	.486**
	Sig. (2-tailed)	.000
	N	87
S57	Pearson Correlation	.457**
	Sig. (2-tailed)	.000
	N	87
S58	Pearson Correlation	.363**
	Sig. (2-tailed)	.001
	N	87
S59	Pearson Correlation	.432**
	Sig. (2-tailed)	.000
	N	87
S510	Pearson Correlation	.291**
	Sig. (2-tailed)	.006
	N	87

Table 7 summarizes the results of Regression analysis. As shown, 5S explains 27.9 % of the variability of employee performance.

Table 7. Regression Analysis Results

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.528[a]	.279	.270	.423	1.689

a. Predictors: (Constant), Total5S

b. Dependent Variable: Total Emp Per

Furthermore, table 8 shows the results of ANOVA test and confirms that the regression model is a good fit of the data. It is obvious that 5S is significantly ($p < 0.0005$) predicting employee performance with $F(1, 85) = 32.887$.

Table 8. Results of ANOVA Test

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	5.890	1	5.890	32.887	.000[a]
	Residual	15.223	85	.179		
	Total	21.113	86			

a. Predictors: (Constant), Total5S

b. Dependent Variable: Total Emp Per

CONCLUSION

During this survey, it was obvious that most of respondents implement the 5S regularly in their everyday activities unintentionally, which means they were not formally applying these steps as a quality standard approach. All employees are empowered to be a part of the continuous improvement process and responsible to deliver high quality services. Moreover, employees are authorized to interfere whenever they sense any shortcoming in the supply chain of the hospital. However, the research findings showed that sorting has been insignificantly related to employee performance unlike the remaining 4S. This reflects how much employees are committed in adapting such quality approaches that support hospitals in being well organized, and helps eliminating wastes and furthermore, makes employees extremely effective in providing clean, standardized and sustained place of work. In conclusion, employees should be formally informed through a guideline on how to sort the items and do necessary training on how to take actions and make operations easier and more accessible. Managers are also recommended to make employees more involved in establishing the quality standards since they are more in touch with workplace operations.

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