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

Rayan Ezzeddine, Malak Aoun

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School of Business, Lebanese International University, Lebanon

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.
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**

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

**Table 2. Research Hypothesis**

**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 is represented by the total number of employees (670 employees).
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    | 0 employees (20-30 years) | 30 employees (31-40 years) | 1 employee (41-55 years) | 1 employee (above 50 years) |
| Education | 35% bba degree | 20% PhD degree | 35% high school | 15% masters degree |
| Working period at current hospital | 40% less than five years | 25% between 5 and 10 years | 1% between 11 and 15 years | 1% more than 20 years |
| Years of Experience | 4 employees less than five years | 20 employees between 5 and 10 years | 2 employees between 11 and 15 years | 6 employees more than 20 years |
| Occupation | 42% Technicians | 22% Nurse | 29% Administration positions | 7% Physician |

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, H1 is accepted.

Table 5. Total Correlation between Research Variables

|          | Total SS | Total Emp Per |
|----------|----------|---------------|
| Pearson Correlation | 1.0628 | .0000 |
| Sig. (2-tailed) | 1.0000 | .0000 |
| N | 87 | 87 |

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 H₂ was rejected.

Table 6. Detailed Results of Correlation Test
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 | R | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|---|----------|-------------------|---------------------------|---------------|
| 5S    | 0.524 | 0.279 | 0.275 | 0.224 | 1.998 |

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

| Source of Variation | Sum of Squares | df | Mean Squares | F | Sig. |
|---------------------|----------------|----|--------------|---|------|
| Residuals           | 53.990         | 85 | 0.639        | 32.887 | <0.0005 |
| Total               | 53.990         | 86 |              |     |      |

**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.

**REFERENCES**

Abdel Khalek El-Sherbiny, N., Younis Elsary, A. and H Ibrahim, E., 2017. Application of the 5S-KAIZEN Approach in Improving the Productivity and Quality of the Healthcare System: An Operational Research. *Journal of Patient Safety & Quality Improvement*, 5(4), pp.594-600.

Agrahari, R.S., Dangle, P.A. and Chandratre, K.V., 2015. Implementation of 5S Methodology in the Small Scale Industry: a Case Study. *Int. J. Sci. Technol. Res.*, 4(4), pp.130-137.

Aoun, M., Hasnan, N. and Al-Aaraj, H., 2018. Relationship between lean practices, soft total quality management and innovation skills in Lebanese hospitals. *Eastern Mediterranean Health Journal*, 24(3).

Asaad, M.N.M., Saad, R. and Yusoff, R.Z., 2015. 5s, Kaizen and Organization Performance: Examining the Relationship and Level of Implementation Using Rasch Model in Malaysian Automotive Company. *International Academic Research Journal of Business and Technology*, 1(2), pp.214-226.

ASQ (2018). Lean five S tutorials. Retrieved from https://asq.org/quality-resources/lean/five-s-tutorial

Aziz, A.A., Nishazini, M.B., Fareza and Azizan, N.A., 2014. Survey to see the impact of 5s implementation among staff of Kpj Seremban specialist hospital, Malaysia. *IOSR Journal of Business and Management*, 16(3), pp.82-96.

Briscoe, D.R. and Claus, L.M., 2008. Employee performance management: policies and practices in multinational enterprises. *Performance management systems: A global perspective*, pp.15-39.

Cherrington, D.J., Reitz, H.J. and Scott, W.E., 1971. Effects of contingent and noncontingent reward on the relationship between satisfaction and task performance. *Journal of applied psychology*, 55(6), p.531.

Claus, L. and Briscoe, D., 2009. Employee performance management across borders: a review of relevant academic literature. *International Journal of Management Reviews*, 11(2), pp.175-196.

Cudney, E.A. and Kestle, R., 2018. *Implementing Lean Six Sigma Throughout the Supply Chain: The
Comprehensive and Transparent Case Study. Productivity Press.

Doll, R.E. and Gunderson, E.K., 1969. Occupational group as a moderator of the job satisfaction-job performance relationship. *Journal of Applied Psychology, 53*(5), p.359.

Ennin, Y.C and Obi, D. *The Export Quality Bulletin.* 2012. SS: good housekeeping techniques for enhancing productivity, quality and safety at the workplace. International trade center.

Erfan, O.M., 2010. Application of lean manufacturing to improve the performance of health care sector in Libya. *International journal of engineering & technology, 10*(6), pp.117-128.

Falkowski, P. and Kitowski, P., 2013. The 5S methodology as a tool for improving organization of production. *PhD Interdisciplinary Journal, 4*(1), pp.127-133.

Ferrand, Y.B., Siemens, J., Weathers, D., Fredendall, L.D., Choi, Y., Pirrallo, R.G. and Bitner, M., 2016. Patient Satisfaction With Healthcare Services A Critical Review. *Quality Management Journal, 23*(4), pp.6-22.

Gowen III, C.R., McFadden, K.L. and Settaturi, S., 2012. Contrasting continuous quality improvement, Six Sigma, and lean management for enhanced outcomes in US hospitals. *American Journal of Business, 27*(2), pp.133-153.

Graban, M., 2016. *Lean hospitals: improving quality, patient safety, and employee engagement.* Productivity Press.

Gupta, S. and Jain, S.K., 2015. An application of SS concept to organize the workplace at a scientific instruments manufacturing company. *International Journal of Lean Six Sigma, 6*(1), pp.73-88.

Hirano, H., 1995. 5 pillars of the visual workplace. Productivity press.

HPP, 2012. Lean healthcare case studies. Healthcare Performance Partners Available at: http://leanhealthcareperformance.com/leancases/studies.php

Ittner, C.D. and Larcker, D.F., 2003. Coming up short on nonfinancial performance measurement. *Harvard business review, 81*(11), pp.88-95.

Jackson, T.L., 2009. *SS for healthcare.* Productivity Press.

Juhari, N.H.B., Abidin, N. and Omar, M.W., 2011. Factors influencing employees’ motivation in implementing 5s system. *Elixir International Journal, 39*, pp.4836-4847.

Kassak, K.M., Ghomrawi, H.M., Osseiran, A.M.A. and Kobeissi, H., 2006. The providers of health services in Lebanon: a survey of physicians. *Human Resources for Health, 4*(1), p.4.

Kennedy, A., Khoja, T.A., Abou Zeid, A.H., Ghannem, H. and IJsselmuilden, C., 2008. National health research system mapping in 10 Eastern Mediterranean countries. *EMJH-Eastern Mediterranean Health Journal, 14*(3), 502-517, 2008.

Kumar, K. and Kumar, S., 2012. Steps for implementation of SS. *International Journal of Management, IT and Engineering, 6*(6), pp.402-416.

Lancaster, J.M., 2011. Lean and Six Sigma in Hospitality Organizations: Benefits, Challenges, and Implementation.

Luthans, F., Avolio, B.J., Avey, J.B. and Norman, S.M., 2007. Positive psychological capital: Measurement and relationship with performance and satisfaction. *Personnel psychology, 60*(3), pp.541-572.

Michalska, J. and Szewieczek, D., 2007. The SS methodology as a tool for improving the organization. *Journal of Achievements in Materials and Manufacturing Engineering, 24*(2), pp.211-214.

Michalska, J. and Szewieczek, D., 2007. The improvement of the quality management by the activity-based costing. *Journal of Achievements in Materials and Manufacturing Engineering, 21*(1), pp.91-94.

Moulding, E., 2010. *5S: A visual control system for the workplace.* Author House.

Papadopoulos, T., 2011. Continuous improvement and dynamic actor associations: A study of lean thinking implementation in the UK National Health Service. *Leadership in Health Services, 24*(3), pp.207-227.

Patel, V.C. and Thakkar, H., 2014. A case study: 5S implementation in ceramics manufacturing company. *Bonfring International Journal of Industrial Engineering and Management Science, 4*(3), pp.132-139.

Patel, V.C. and Thakkar, H., 2014. Review on implementation of SS in various organization. *International Journal of Engineering Research and Applications, 4*(3), pp.774-779.

Randhawa, J.S. and Ahuja, I.S., 2017. 5S implementation methodologies: literature review and directions. *International Journal of Productivity and Quality Management, 20*(1), pp.48-74.

Sabry, A., 2014. Factors critical to the success of Six-Sigma quality program and their influence on performance indicators in some of Lebanese hospitals. *Arab Economic and Business Journal, 9*(2), pp.93-114.

Saleh, S.S., Bou Sleiman, J., Dagher, D., Sbeit, H. and Natafi, N., 2013. Accreditation of hospitals in Lebanon: is it a worthy investment?. *International journal for quality in health care, 25*(3), pp.284-290.

Sánchez, P.M., Rodríguez, C.M., Maruyama, U. and Salazar, F., 2015. September. Impact of 5S on
quality, productivity and organizational climate—Two Analysis Cases. In Proceedings of the International Conference on Operations Excellence and Service Engineering (pp. 748-755).

Sorooshian, S., Salimi, M., Bavani, S. and Aminattaheri, H., 2012. Case report: Experience of 5S implementation. Journal of Applied Sciences Research, 8(7), pp.3855-3859.

Tabitha, M.M., influence of occupational health and safety practices on employee performance at Kenya Power And Lighting Company.

Tangen, S., 2004. Performance measurement: from philosophy to practice. International journal of productivity and performance management, 53(8), pp.726-737.

Tyler, F., 2015. Characteristics and challenges of the health sector response in Lebanon. Field Exchange 48, p.43.

Williams, R.S., 2002. Managing employee performance: Design and implementation in organizations. Cengage Learning EMEA.

World Health Organization, World Health Organization. Global Observatory for eHealth and WHO Global Observatory for eHealth, 2006. Building foundations for eHealth: progress of Member States: report of the WHO Global Observatory for eHealth. World Health Organization.

Young, F.Y., 2014. The use of 5S in healthcare services: A literature review. International Journal of Business and Social Science, 5(10).