

Integrating DMAIC approach of Lean Six Sigma and information technology to improve the practice of Management By Wandering Around (MBWA) in healthcare: A case study

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ISQUA2023
-ABS-1543
(P050)

INTRODUCTION

Integration of information technology (IT) and lean management is an important issue of Industry 4.0 (4-6). Further empirical studies are recommended for the integration of lean management and IT(4). **Lessons from manufacturing lean management may not directly apply to healthcare's unique characteristics.** Furthermore, limited research exists on improving internal customer and administrative processes with **Lean Six Sigma (LSS) in healthcare**(1-3).

AIM

This study presents a case that focuses on integrating lean management and information technology (IT) to enhance the efficiency of Management By Wandering Around(MBWA), an important practice in many hospitals in Taiwan.

METHOD

This study focuses on integrating lean management and IT to enhance MBWA efficiency of Shin Kong Hospital (SKH), an 829-bed medical center in Taiwan . **The study uses a before-and-after design with three stages: pre-intervention, intervention, and post-intervention, following the DMAIC approach, a data-driven five-step method for process improvement within Lean Six Sigma.**

CONCLUSIONS

Integrating lean management and IT, particularly through Lean Six Sigma and the DMAIC approach, effectively improves MBWA efficiency in our hospital. **This research highlights the potential of combining lean principles with IT to optimize processes, enhance customer satisfaction, and drive overall performance.**

ACKNOWLEDGEMENT

The IT system introduced in this study was built with the support of the General Affairs Department of Shin Kong Hospital and YI-KONG SECURITY CO. IT system training was provided by YIFENG SOFTWARE CO.

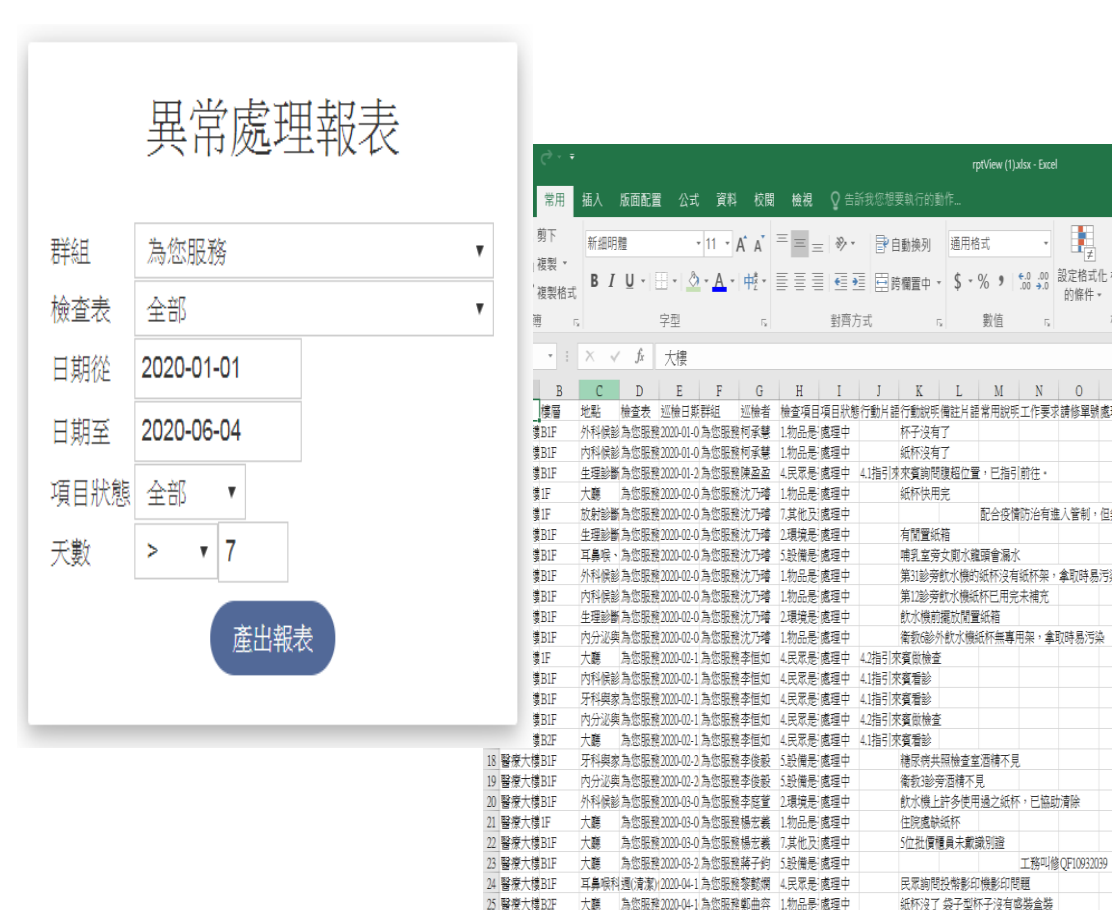
RESULTS

The IT system was designed based the three main pillars of the Toyota Production System (TPS).



▲ **Figure 1: Just-in-time (JIT)**

The just-in-time feature of the IT system enables on-duty personnel to **promptly report abnormal events.**



▲ **Figure 2: automation (Jidoka)**

Automation eliminates the procedure of manual form filling, as **forms are automatically completed once the task is finished.**

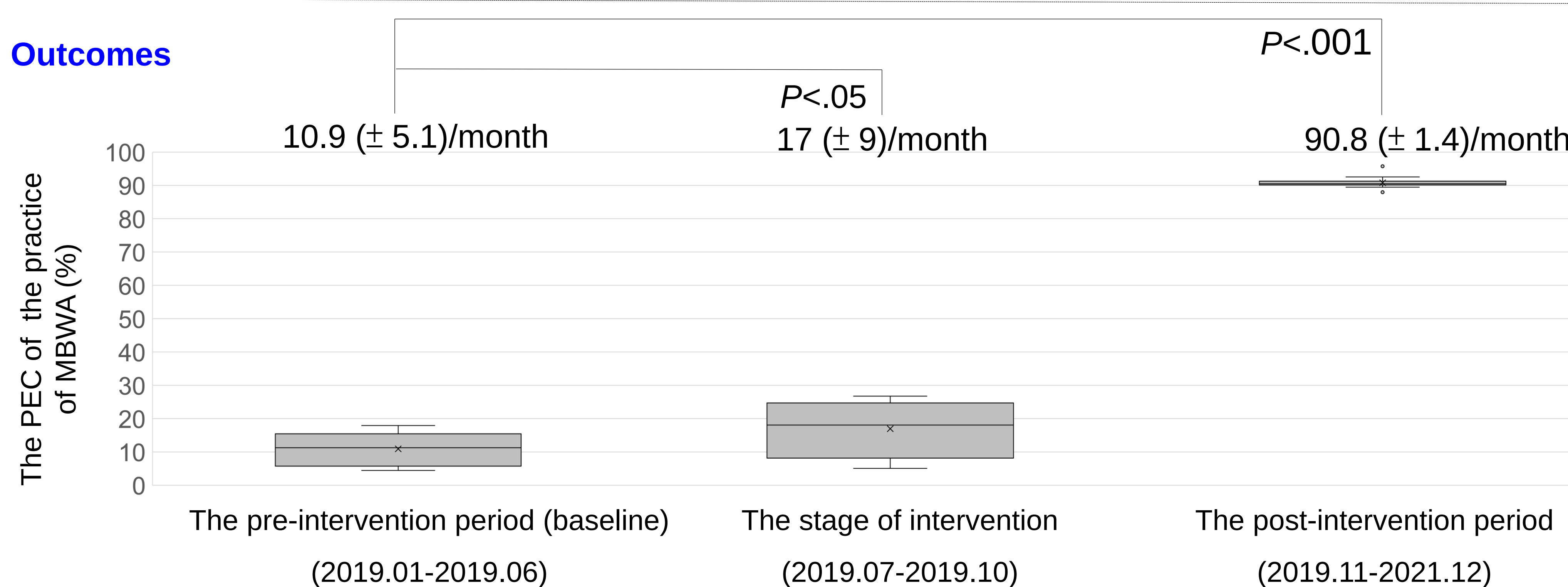


▲ **Figure 3: visual management (Kanban)**

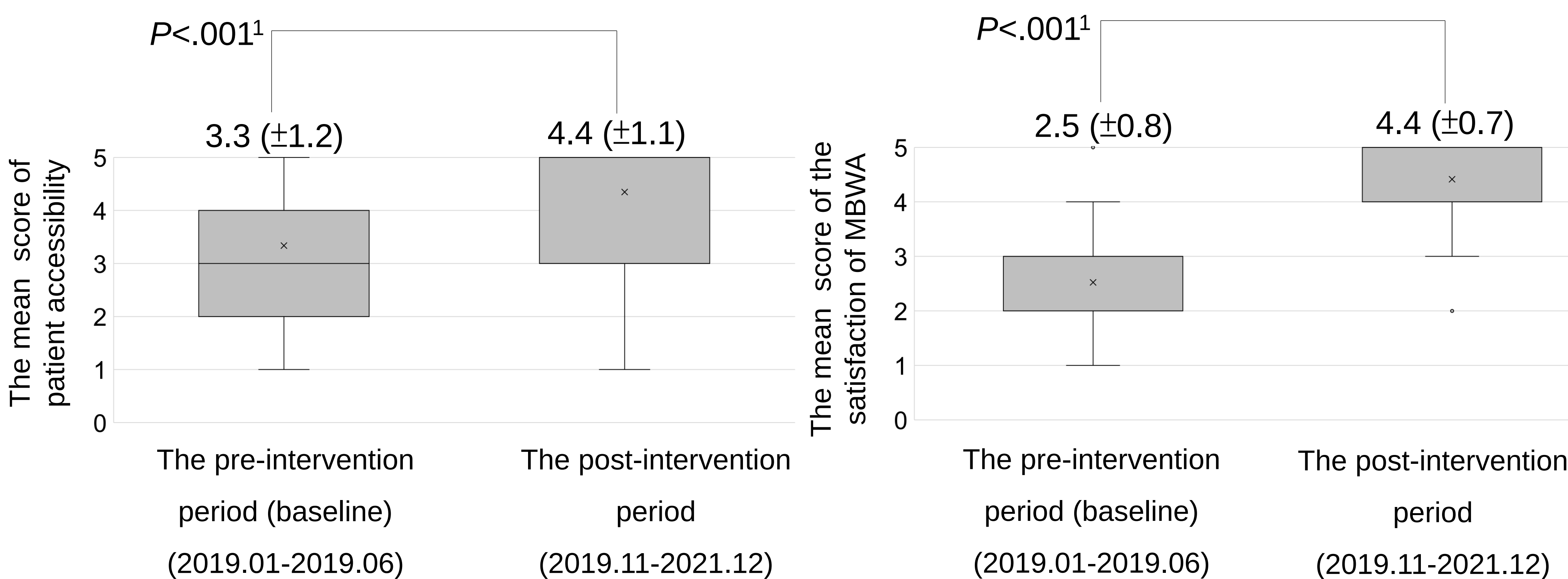
Real-time data collection within the IT system enables calculation and **visualization of the risk of anomalies at each service location, providing early insights into potential cause-and-effect relationships.**

The lower the score, the higher the risk of an abnormal event occurring at the site.

Outcomes



▲ **Figure 4: The PEC in different periods. PEC= process cycle efficiency**



▲ **Figure 5: patient accessibility.¹ Independent Sample t test**

▲ **Figure 6: The staff' satisfaction of MBWA.¹ Independent Sample t test**

Key performance indicators include process cycle efficiency (PCE), staff satisfaction with MBWA, and patient accessibility. **The intervention and post-intervention stages show significant improvements in PCE compared to the baseline** (mean = 17%, SD = 9, p < .05, and mean = 90.8%, SD = 1.4, p < .001, respectively) (Fig. 4). **Staff satisfaction and patient accessibility scores also increase significantly** (mean = 4.4, SD=0.7, p<.001, and mean = 4.4, SD=1.1, p<.001, respectively) (Fig. 5,6).

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