

IMPROVING PATIENT SAFETY WITH A SMART LOCATION TRACKING SYSTEM

SJ. OH, MH. PARK and JM. HAN

National Health Insurance Service Ilsan Hospital, Ilsandong-gu, Goyang-si, Gyeonggi-do, Republic of Korea

INTRODUCTION

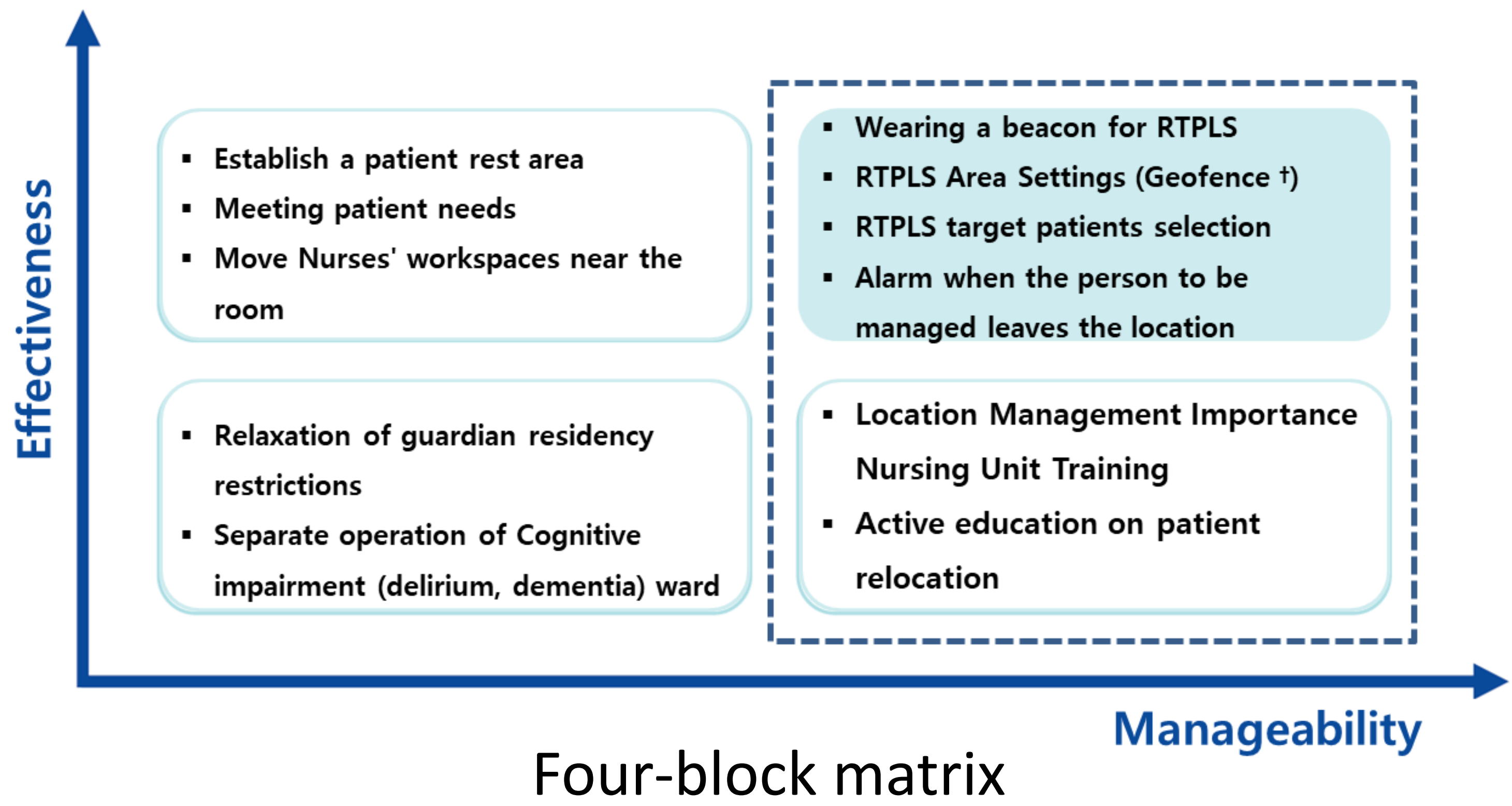
- Getting location information of inpatients is essential to medical staff and imposes significant workload on the healthcare providers
- High risk patients with Alzheimer or delirium and patients who need complete bedrest often leave specified locations, which could deteriorate their condition

AIM

- This study utilized a real-time patient location tracking system (RTPLS) to reduce any unexpected risk and workload

METHODS

The task of locating patients in wards with a RTPLS was organized with a schematic template. We conducted a review of records and a pre-intervention survey asking work and time load needed for locating inpatients using standardized forms. The cause–effect diagram was used to determine the root cause. The lack of clear criteria for patient location and various situations, blind spots difficult to monitor according to the location of the hospital room, and transparent criteria that should only be applied to inpatients were derived.



Four-block matrix



Schematic figure of RTPLS



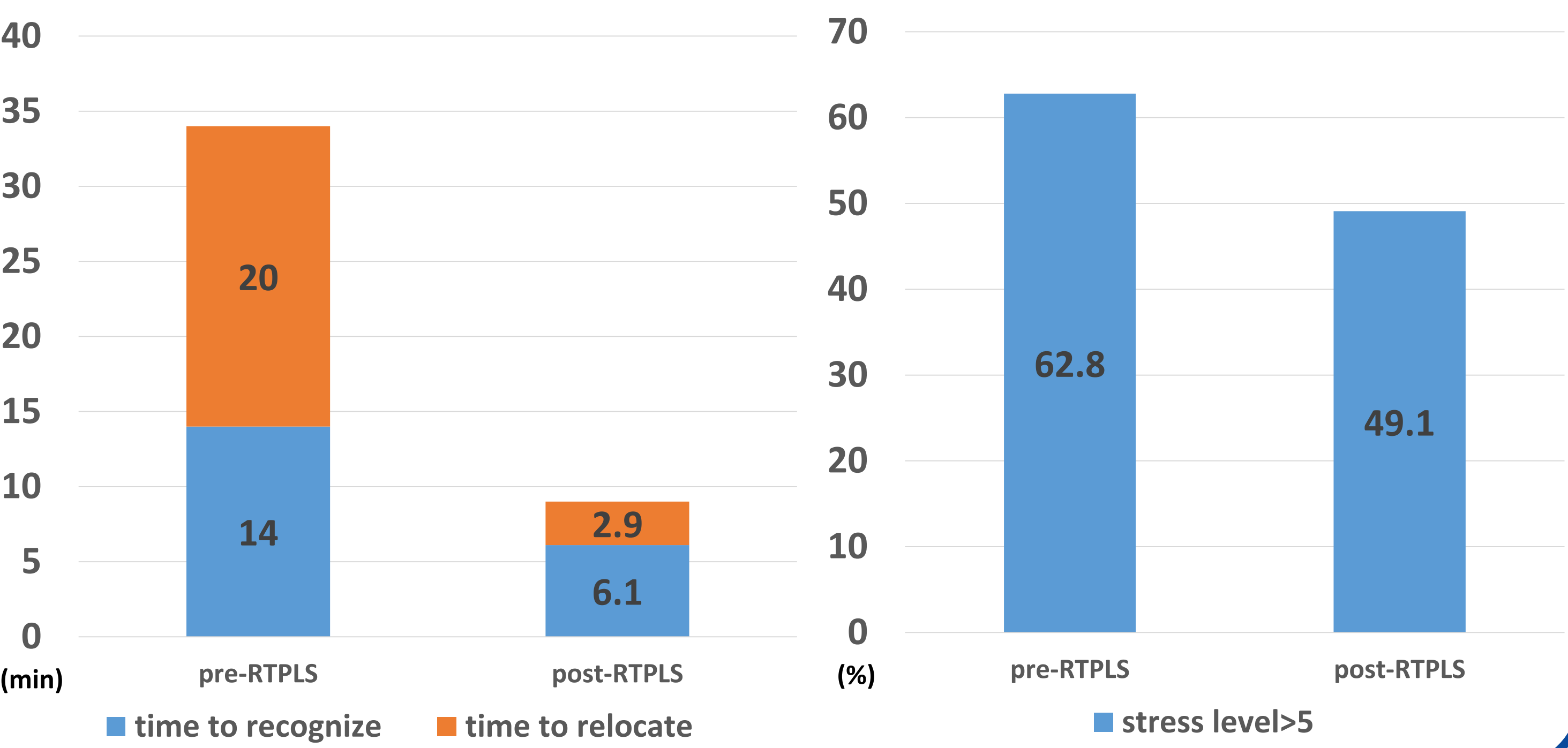
Representative image of monitoring platform

The following implementations were conducted using a four-block matrix.

- We built a RTPLS which includes Bluetooth signal transmitters applied on patients' wrist bracelet and signal receivers mounted on the ceilings of wards. Location data of inpatients are stored in server and can be searched in real-time manner in the case of patients' absence.
- Operation of the RTPLS based high-risk patient management system
 - Identifying mandatory group: High-risk patients for location tracking (high risk of falling, dementia, delirium, desertion, etc.) of inpatients in wards
 - Developing real-time dashboard screens that enable alarms for high-risk groups (PC sound alarms and red alarm markings on the computer)
 - Creating guidelines/manual and Distributing training Materials

RESULTS

According to pre-intervention survey(for 14days, 61cases), it took 14min to recognize the patient's absence in the ward and 20min to relocate the patient's location. 62.8% of Medical staff ranked their stress level above 5 out of 10 on the task for locating the patient. From October 2021 with installation of RTPLS and high-risk patient management system, data were collected from 72cases for 15days and analyzed for each indicator. Time to recognize patient's absence (primary indicator) was significantly reduced to 6.1min compared with 14 min of pre-intervention survey results. Time to relocate the patients (second indicator) are also reduced to 2.9min compared with 20min of pre-intervention survey results and accomplished primary task target. Stress level-related to patient positioning above 5 points (tertiary indicator) also achieved the goal at 49.1% and confirmed that the stress of nurses on positioning was reduced thanks to RTPLS and high-risk alarms.



CONCLUSION

A systematic management system for high-risk groups was established by building a RTPLS in this activity. By building a system that simultaneously provides sound alarms and screen warning alarms when high-risk groups leave, patients could be located in real time, and the stress score was reduced by allowing nurses to recognize them when leaving high-risk groups quickly. This is an innovative reference of providing medical staff with alarm information that expands real-time location and location solutions.