Objective of this study: to identify the effect of using the Lean principles and tools on the staff satisfaction and the turnaround time (TAT) inside the emergency department (ED) of an acute care general Saudi Hospital.

Study period: from December 2011 till May 2012.

Study location: area “A” of the ED which is dedicated for serving the more critical cases received at the ED. (i.e., patients belonging to categories 1-3 of the Australian Triage Scale).

Hypotheses: this study has one main hypothesis broken down into 10 sub-hypotheses; the first nine sub-hypotheses are based on the nine questions of the questionnaire. The tenth sub-hypothesis is based on effect of Lean implementation on the average TAT of the ED patients.

Methodology: only ED patients admitted to area “A” are included in this study, except Ob/Gyne cases and psychiatric cases. A systematic random sampling technique was used to select the days representing the seven days of the week; the data of the ED patients who visited the ED during the selected seven days were analyzed. A sample of 196 patients was taken before the intervention and a sample of 199 patients was taken after then intervention.

Results:

1. Average turnaround time (TAT) of patients managed at areas “A” decreased from 7.6 to 2.8 minutes (p < 0.05).
2. The Royal Commission Health Services Program (Fri) (5Ss tool) was used for this purpose.
3. The questionnaire was distributed to a selected group of the ED staff (physicians and nurses) using the convenience sampling technique. Six physicians (35% of ED physicians) and twenty-two nurses (65% of the ED nurses took the questionnaire.

Standardized arrangement of items: the items kept inside the IV trolley drawers were organized in a standardized manner. The new arrangement was standardized across all drawers in IV trolleys present in area “A”, including the drawers in the resuscitation rooms.

Footprinting: a tape was placed around the default storage/parking area for each trolley. An initial for the name of the trolley was taped on the floor inside this area (e.g., “D” stands for dressing & “E” stands for ECG). A pad of stick notes was posted on the wall just above each trolley.

Floor marking: a black line extending on the floor from the main reception in area “A” (left photo) to the nearby Radiology department (right photo).

Modifying bed setup between patients: 4 different IV fluids bags were hanged on the IV stand as a part of the setup of the bed before receiving a new ED patient.

ED floor map: shows the distribution of different areas/rooms, was used to identify the wasted movement inside the ED.

Footprinting:

- Men: 2
- Women: 2
- Ambulance: 2
- Patient: 2
- Resuscitation Room: 1

Footprinting: the wasted motion inside the ED during care process to patients. ED floor map was used for this purpose.

Discussion:

Lean manufacturing tools can be successfully implemented in Saudi healthcare settings. They could improve the organization of the workplace, provide social and psychological, and minimize verbal communication among the ED staff. Staff satisfaction and knowledge of their workplace generally improve. All these outcomes could be achieved with minimal cost and with using Lean interventions.

Standardized arrangement of items:

- 1. Standardized arrangement of items.
- 2. Stores areas.
- 3. Container boxes.
- 4. Images displaying the content.
- 5. Footprinting.
- 6. Floor marking.
- 7. Modifying bed setup between patients.
- 8. Statuses of beds.

Footprinting:

- 1. A 15 cm line was taped on the floor inside this area
- 2. A 6 cm line was taped on the floor inside this area
- 3. A 2 cm line was taped on the floor inside this area
- 4. A 1 cm line was taped on the floor inside this area

Footprinting:

- 1. The leftmost column shows the list of the beds at area “A” of the ED.
- 2. The middle column shows the color-coded magnets which indicate the different statuses of the beds.
- 3. The rightmost column shows the space left for the sticky notes.

Footprinting:

- 1. The color-coded magnets which indicate the different statuses of the beds.
- 2. The rightmost column shows the space left for the sticky notes.

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