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Reducing waiting time in a medical clinic of a secondary care hospital in Sri Lanka: An audit and quality improvement project

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Abstract

Background: Long outpatient waiting times are a persistent feature of Sri Lanka's government hospitals, contributing to patient dissatisfaction and pushing better-off patients toward costlier private care. Published, completed audit cycles from secondary care (base hospital) clinics remain scarce despite a national guideline for measuring waiting time.

Objective: To measure and reduce patient waiting time in the general medical clinic of a secondary care hospital in Sri Lanka through a complete clinical audit cycle.

Methods: A baseline audit of 180 patients over 10 clinic days (January 2025) measured stage-wise and total waiting time using the national DHQS methodology. Twelve key informants scored candidate causes of delay for impact and feasibility; causes meeting pre-set thresholds were addressed through three sequential PDSA cycles — staggered arrival slots, an additional peak-hour registration counter, and a pharmacy token/pre-packing system — run between February and June 2025. A re-audit of 172 patients over 10 clinic days (June 2025) compared outcomes with baseline.

Results: Mean total visit time fell from 118 minutes (SD 31) at baseline to 74 minutes (SD 19) at re-audit, a 37.3% relative reduction ($p < 0.001$). Every stage improved, with registration showing the largest proportional gain (−54.2%). The proportion of patients waiting over 90 minutes fell from 62% to 21%, while mean consultation time was essentially unchanged (3.4 vs 3.5 minutes).

Conclusion: A structured baseline audit, staff-informed prioritisation, and three low-cost PDSA cycles cut mean waiting time by more than a third without additional staff or capital expenditure, offering a transferable model for other Sri Lankan secondary care clinics.

Keywords: Waiting time; Quality improvement; PDSA cycles; Clinical audit

1. Introduction

Outpatient care in Sri Lanka's government hospitals is free at the point of delivery, and the demand placed on it is enormous. The National Hospital of Sri Lanka (NHSL) alone treats roughly 690,000 outpatients a year, and a doctor there examines around 36 patients an hour, less than two minutes per consultation [1]. Against this background, long waits are an everyday experience for patients, and they are not merely an inconvenience. The World Bank's case study of Sri Lankan universal health coverage found that a private outpatient visit takes less than half the time of a government

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hospital visit, and argued that because public OPD visits are so slow, better-off patients self-target into private care [2]. De Silva and colleagues described the same phenomenon in terms of "push and pull" factors, identifying long outpatient queues as one of the "weak links" pushing even poor households towards paid care [3].

Waiting time is also a measurable quality indicator. The Directorate of Healthcare Quality and Safety (DHQS) of the Ministry of Health (Currently known as 'Patient Safety and Accreditation Bureau') has issued a national guideline that standardises how waiting time in outpatient departments and clinics should be calculated, from registration to leaving the pharmacy, with step-wise analysis of each stage [4]. That guideline gives hospital teams a common yardstick, yet published completed audit cycles from Sri Lankan secondary care settings remain few.

Our institution is a base hospital providing secondary care. Its general medical clinic, run under the Consultant Physician with administrative matters overseen by the Nursing Officer In-charge (NOIC), operates a referral based walk-in ticket system: patients arrive from early morning, take a numbered clinic ticket, and are registered and seen in order. Staff had long complained of morning congestion, and patients of waits that swallowed half a working day, but no formal measurement had ever been done. We therefore undertook a clinical audit of waiting time in this clinic, followed by a quality improvement (QI) project using Plan–Do–Study–Act (PDSA) cycles and a re-audit to close the loop. This article reports the baseline findings, the prioritisation process, and the re-audit results.

1.1 Justification

Three considerations justified the project. First, the local problem was real but unquantified. Anecdote suggested long waits, but without baseline measurement there was no way to judge severity, target the worst stage, or demonstrate improvement to hospital management.

Second, the economic argument is well documented nationally. When patients leave government queues to pay for private consultations, or abandon visits altogether, the system loses twice: it bears the fixed costs of underused clinics while households incur out-of-pocket spending [2, 3]. Reducing waiting time is an equity measure as much as an efficiency measure.

Third, there was a methodological gap we could usefully fill. Sri Lankan waiting-time studies have concentrated on tertiary institutions such as the NHSL and Lady Ridgeway Hospital for Children [1, 5, 6]. Interventional work at primary care level exists — Thivakar [7] showed significant reductions at two divisional hospitals in Kilinochchi — but published, completed audit cycles from base hospital medical clinics are scarce. A transparent account of a modest, low-cost intervention at this level seemed worth adding to the local literature.

Objectives

General objective

- To measure and reduce patient waiting time in the general medical clinic of a secondary care hospital in Sri Lanka through a complete audit cycle.

Specific objectives

- To measure stage-wise and total waiting time at baseline.
- To identify and prioritise the modifiable causes of delay through key informant interviews with clinic staff and stakeholders.
- To implement sequential PDSA cycles addressing the highest-priority causes.
- To re-audit waiting time after the intervention period to compare improvement against the baseline.

2. Literature Review

Sri Lankan data on outpatient waiting time span more than a decade and show striking variation by level of care. At the tertiary end, Jayawardena [5] studied 150 patients at the NHSL general outpatient department and reported median waits of 24 minutes at registration, 42 minutes from registration to the doctor's room, and 97 minutes at the pharmacy; patients spent about two hours in the department on average, rising to three to four hours at peak times. A queuing-theory analysis at the same institution recommended adjusting doctor numbers and pharmacy counters to match hourly demand [8]. Ranasinghe et al. [1] approached NHSL congestion qualitatively, using key informant interviews, focus

group discussions, and an Ishikawa diagram; the root causes they identified (poor layout, late starts, no patient information system, a weak referral mechanism) read like a checklist of the problems seen in smaller hospitals too.

At the other end of the system, waits appear considerably shorter. A 2023 audit of three district hospitals in Gampaha District found mean morning waits of 43–47 minutes and afternoon waits of 18–31 minutes, although consultation times of 1.7–4.3 minutes fell well short of the authors' 13–16 minute standard [9]. A conference abstract from the National Health Research Symposium 2019 reported on outpatient waiting time across the four base hospitals of Batticaloa District; waiting for consultation was the longest stage, total waits were comparatively short, under 30 minutes, and the authors recommended over-the-phone registration and appointment systems [10]. As a symposium abstract rather than a peer-reviewed paper, its findings should be read as indicative. Hettiarachchi et al. [11] compared outpatient utilisation at Base Hospital Homagama before and after the COVID-19 outbreak and found that average waiting time for doctor consultations and dispensary services was shorter in 2022 than in 2019, a change they attribute largely to reduced patient loads rather than any deliberate intervention.

Interventional and methodological precedents informed our design. Thivakar [7], working at two divisional hospitals in Kilinochchi District, used basic QI techniques in a pre/post design and reduced overall waiting time significantly, by 21.8 minutes ($P < 0.01$) and 13 minutes ($P < 0.05$) at the two sites. At Lady Ridgeway Hospital for Children, Krishanth et al. [6] identified contributors to long waits, which were patient surges, lack of automation, inadequate rooms and laboratory capacity, and prioritised them with staff using the nominal group technique, a precedent for structured stakeholder prioritisation in Sri Lankan hospital QI. Survey evidence from Kandy district links Lean practices (5S, visual management, kaizen) to significantly shorter outpatient waits: Thamilnila and Aryarathne [12] found that Lean practice adoption had a strong negative effect on OPD waiting time in Kandy public hospitals ($\beta = -0.626$, $p < 0.001$). A construction-management study has applied queuing models to layout and counter design in Sri Lankan outpatient departments [13].

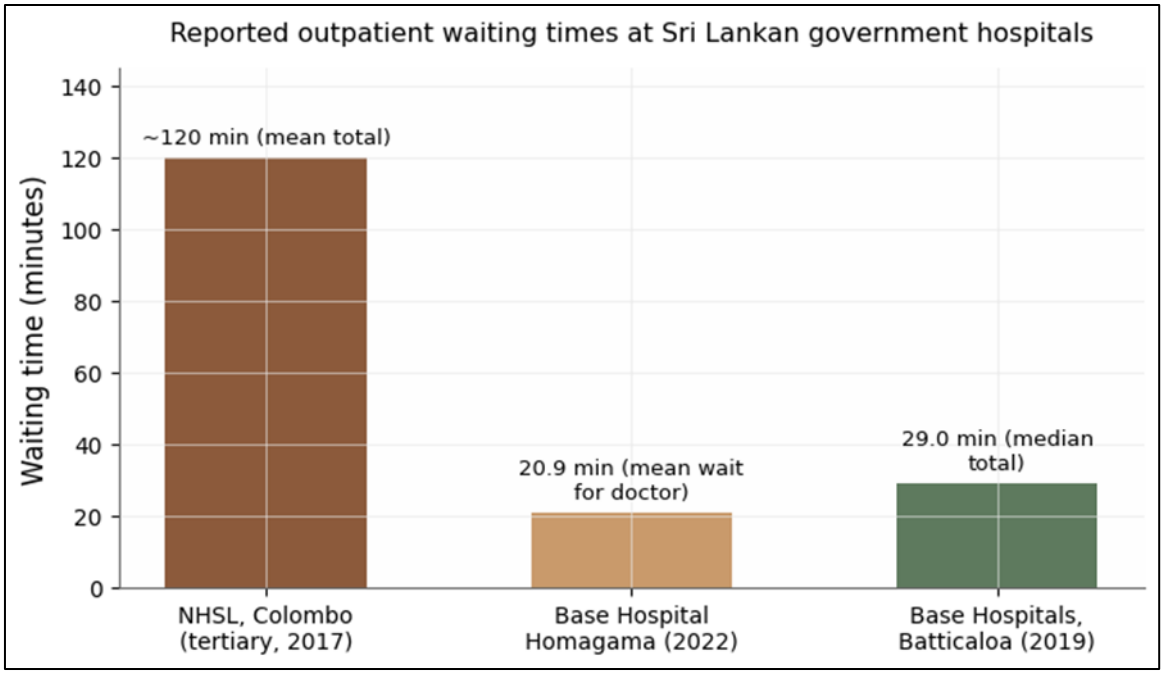

Figure 1 Published outpatient waiting times reported from Sri Lankan healthcare facilities, by level of care. Values are drawn from the studies cited in the text; the Batticaloa figure is from a conference abstract and is shown for comparison only.

Regional and global literature places these figures in context. At a tertiary care hospital in northern India, Yadav et al. [14] reported median waits of 54 minutes for registration, 15 minutes for consultation, 33 minutes for sample collection, and 61 minutes for drug dispensing, and used a fishbone analysis to dissect pharmacy delays. A study at a tertiary hospital in Karachi found a mean total wait of 164 minutes, with increased patient load cited by 91.6% of respondents as the leading cause [15]. Systematic reviews of Lean and Lean Six Sigma in outpatient settings report reductions from about 5% to over 90% across heterogeneous studies, while cautioning that staff and management commitment determines whether gains persist [16, 17]. Figure 1 summarises published waiting times at Sri Lankan facilities, illustrating the gradient from tertiary to district level.

3. Methods

3.1 Study design and setting

We conducted a completed clinical audit cycle embedded in a quality improvement project between January and June 2025. The setting was the general medical clinic of a base hospital (secondary care) in Sri Lanka; the institution is not named, in keeping with the conditions of administrative approval. The clinic runs on weekday mornings under the consultant physician and uses a referral based walk-in clinic ticket system with first-come, first-served flow through three stages: registration, consultation, and the pharmacy/dispensary. The baseline audit was carried out in January 2025, the improvement cycles from February to June 2025, and the re-audit in June 2025.

3.2 Problem analysis: baseline audit, time-motion observation, and measurement standard

The baseline audit followed the national DHQS guideline for calculating waiting time in outpatient departments and clinics [4]. The investigator used direct time-motion observation: each patient was issued a data-collection form at registration on which arrival time was stamped, and trained data collectors recorded times at entry to and exit from each subsequent stage. Clocks at all stations were synchronised each morning, and the form and process were piloted on one clinic day before data collection began. Waiting time was defined, per the guideline, as the interval from registration to leaving the pharmacy, and we additionally computed the wait at each stage and the total clinic visit time. The baseline sample comprised 180 patients observed across 10 clinic days (weekday mornings). Consultation time was recorded separately so that we could later check whether shorter waits had been achieved at the expense of shorter consultations.

3.3 Key informant interviews for problem prioritization

Following Ranasinghe et al. [1], whose NHSL study combined key informant interviews with structured root-cause analysis, we interviewed 12 informants: the NOIC, 2 consultant physicians, 3 medical officers, 2 nursing officers, 1 pharmacist, 1 dispensary assistant, 1 hospital administrator, and 1 security officer attached to the outpatient department. Interviews were semi-structured, lasted 20–35 minutes, and were conducted in the informant's preferred language. Transcribed notes were analysed thematically to generate a candidate list of causes of delay. Each informant then scored every candidate cause on 1–5 scales for impact on waiting time and feasibility of addressing it within existing resources, an approach broadly similar to the nominal group prioritisation used by Krishanth et al. [6]. Causes with a mean impact score of 4 or above and a mean feasibility score of 3.5 or above were taken forward for intervention.

3.4 Data analysis

Waiting-time distributions were positively skewed and departed from normality on Shapiro–Wilk testing. We therefore report means with standard deviations for comparability with earlier Sri Lankan work, but tested differences with the Mann–Whitney U test; proportions were compared with the chi-square test. Statistical significance was set at $p < 0.05$. Analysis was performed in SPSS version 21. KII scores are reported as means, and qualitative material as themes.

3.5 Ethical considerations

The project was approved by the hospital administration. As a quality improvement project using anonymised routine service data, it was exempt from full ethics committee review under local practice. Key informants participated after giving verbal consent, and no patient-identifiable data were collected at any point.

4. Interventions

The prioritisation exercise (Table 2) selected three causes for action: the absence of any appointment or scheduling mechanism, peak-hour congestion at registration, and manual pharmacy dispensing. Each was addressed in a PDSA cycle, and two supporting measures ran alongside.

- **PDSA 1 (weeks 7–8): staggered arrival slots.** Patients were allocated 30-minute arrival blocks according to clinic ticket number ranges, announced at ticket issue and posted at the entrance. The aim was to flatten the early-morning arrival spike that fed every downstream queue.
- **PDSA 2 (weeks 10–11): a second registration counter at peak.** An additional registration desk was opened from 7.30 to 9.30 am, staffed by an attendant reallocated from a low-demand station. No new staff were hired.

- **PDSA 3 (weeks 13–14): pharmacy token system and pre-packing.** The dispensary introduced a numbered token system with a queue display, and commonly issued drugs were pre-packed in standard quantities during slack periods, cutting per-prescription assembly time.

Supporting measures comprised new directional signage from the entrance through registration to the dispensary, and a daily 8.00 am start-time huddle to confirm that all stations opened together. We deliberately confined the package to changes achievable within the existing budget and establishment; an intervention requiring new posts or capital works would not survive contact with a secondary care hospital's planning cycle.

5. Results

5.1 Baseline audit

At baseline the mean total clinic visit lasted 118 minutes (SD 31; range 47–196). Waiting for consultation was the longest stage at a mean of 52 minutes (SD 18), followed by pharmacy at 38 minutes (SD 14) and registration at 24 minutes (SD 9) (Table 1). Nearly two thirds of patients (62%) waited more than 90 minutes in total, and only 8% completed the visit within an hour. Mean consultation time was 3.4 minutes, short and consistent with the 1.7–4.3 minutes reported from Gampaha district hospitals by Prasanthi et al. [9].

Table 1 Mean waiting time by stage at baseline (January 2025) and re-audit (June 2025)

Stage	Baseline mean, min (SD)	Re-audit mean, min (SD)	Absolute change, min	% change
Registration	24 (9)	11 (6)	−13	−54.2
Waiting for consultation	52 (18)	34 (12)	−18	−34.6
Pharmacy/dispensary	38 (14)	23 (9)	−15	−39.5
Total clinic visit	118 (31)	74 (19)	−44	−37.3

5.2 Key informant prioritization

Thematic analysis of the 12 interviews yielded 8 candidate causes. Mean impact and feasibility scores are given in Table 2 and plotted in Figure 2. Three causes met the pre-specified thresholds (impact ≥ 4, feasibility ≥ 3.5): absence of an appointment or scheduling system, peak-hour congestion at registration, and manual pharmacy dispensing. Notably, the causes often blamed in corridor conversation — staff shortages at counters and too few consultation rooms — scored moderately for impact but poorly for feasibility; neither could be fixed within the hospital's existing cadre.

Table 2 Key informant prioritization scores for candidate causes of delay (n = 12 informants; 1–5 scales)

Candidate cause	Mean impact	Mean feasibility	Priority rank
Absence of appointment/scheduling system	4.6	3.8	2
Peak-hour congestion at registration	4.4	4.5	1
Manual pharmacy dispensing	4.2	3.6	3
Poor signage and patient guidance	2.8	4.6	4
Late start of clinics	3.1	4.2	5
Staff shortage at counters	3.7	2.3	6
Investigation result delays	3.0	2.6	7
Shortage of consultation rooms	3.4	2.1	8

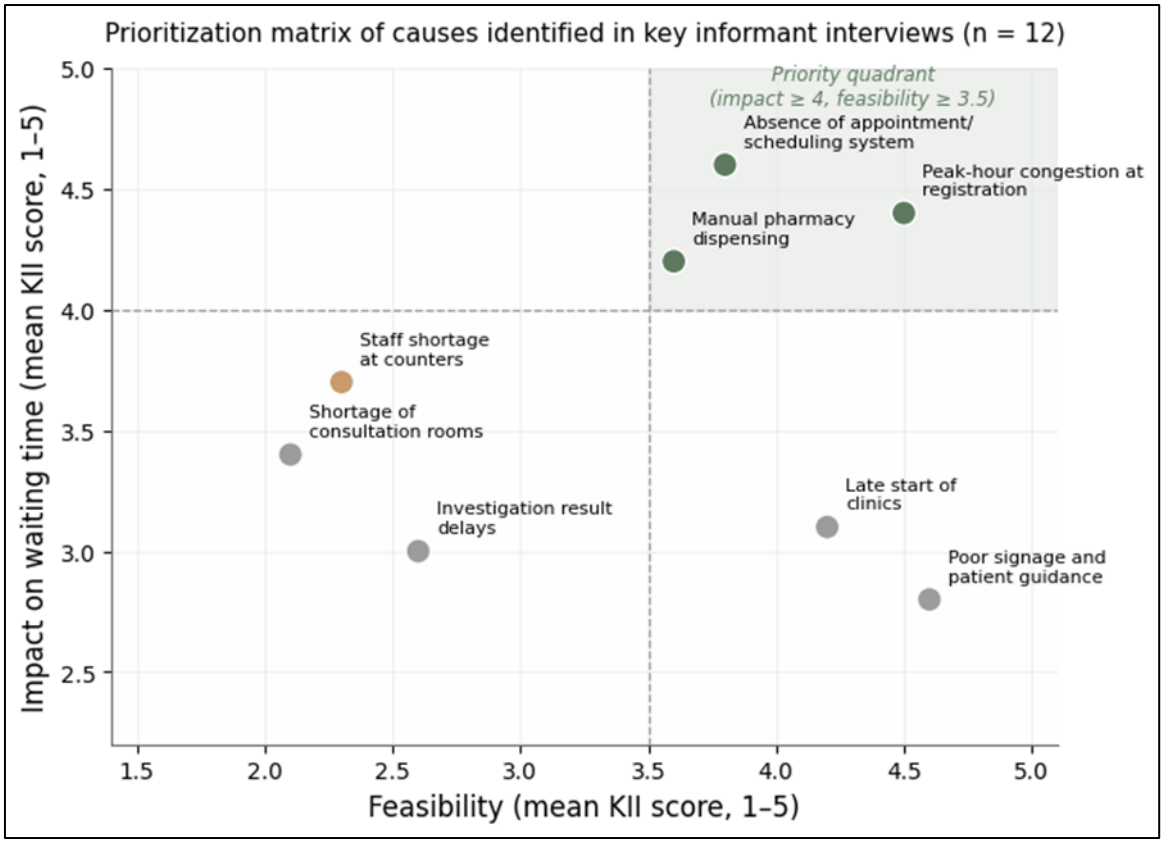

Figure 2 Prioritization matrix from the key informant interviews. Mean impact scores are plotted against mean feasibility scores for the eight KII-identified causes of delay; dashed lines mark the selection thresholds (impact 4.0, feasibility 3.5), and the shaded upper-right quadrant contains the three causes prioritized for PDSA cycles.

5.3 Re-audit and run chart

The three PDSA cycles and their observed effects are summarised in Table 3.

Table 3 Summary of the three PDSA cycles

Cycle	Weeks	Change idea	Measure	Observed effect
PDSA 1	7–8	Staggered arrival slots by ticket-number blocks (30-min blocks)	Weekly mean total wait; arrival distribution	Early-morning arrival peak flattened; first stepwise fall in weekly mean total wait
PDSA 2	10–11	Second registration counter open 7.30–9.30 am, staffed by reallocation	Registration-stage wait during peak	Marked reduction in peak registration wait; largest single-stage gain (54.2% at re-audit)
PDSA 3	13–14	Pharmacy token system, queue display, pre-packing of common drugs	Pharmacy-stage wait	Pharmacy wait reduced (39.5% at re-audit); smoother dispensary flow

The re-audit of 172 patients over 10 clinic days in June 2025 found a mean total visit of 74 minutes (SD 19), an absolute reduction of 44 minutes and a relative reduction of 37.3% ($p < 0.001$, Mann–Whitney U). Every stage improved, with the largest proportional gain at registration (Table 1; Figure 3). The proportion of patients waiting over 90 minutes fell from 62% to 21%, and the proportion completing within 60 minutes rose from 8% to 36%. Mean consultation time was essentially unchanged (3.5 versus 3.4 minutes), so the shorter waits were not bought by shortening consultations.

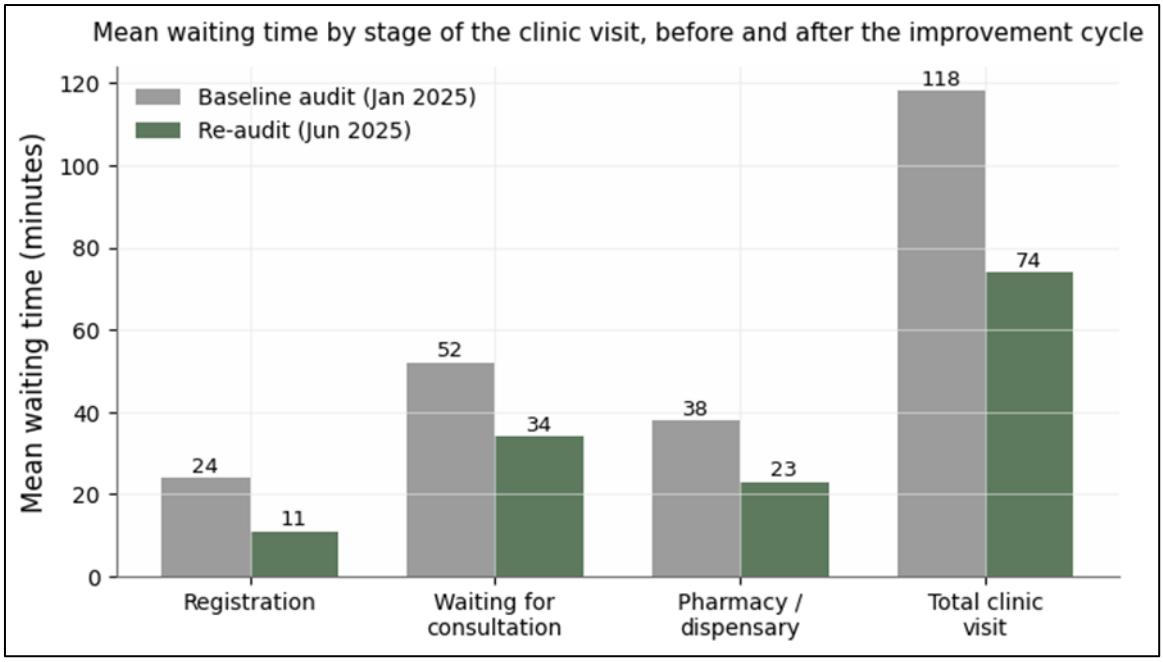

Figure 3 Mean waiting time by stage of the clinic visit at the baseline audit (January 2025) and the re-audit (June 2025).

Weekly mean total waiting time, tracked on a run chart (Figure 4) over weeks 1–20, fell stepwise with each cycle: from around 118 minutes during the baseline weeks (weeks 1–6) to 74 minutes by week 16, and the reduced level held for the four weeks of observation after the final cycle.

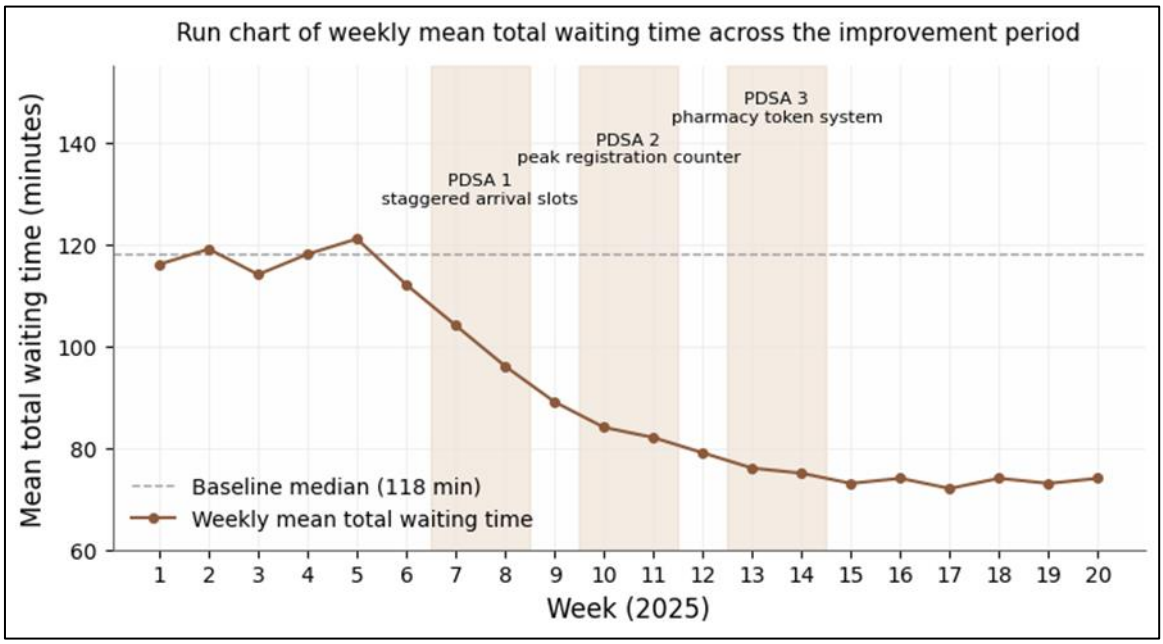

Figure 4 Run chart of weekly mean total waiting time, weeks 1–20, with the three PDSA cycles shaded; the baseline median of 118 minutes is shown as a dashed line.

6. Discussion

A 37.3% relative reduction in mean total waiting time, achieved without new staff or capital expenditure, compares favourably with the published Sri Lankan experience. Thivakar [7] reported absolute reductions of 13–21.8 minutes at two divisional hospitals; our absolute reduction of 44 minutes is larger, though the comparison must be made cautiously

since our baseline was far higher. The pattern is also consistent with the wider Lean literature, where reported reductions span an enormous range, from about 5% to over 90%, depending on context and baseline performance [16, 17]. High-baseline clinics have the most to gain from simple flow changes, and ours was such a clinic.

Three observations deserve emphasis. First, the prioritisation step mattered. Left to intuition, the team would probably have lobbied for more consulting rooms or more counter staff, the two causes that scored worst on feasibility. Scoring impact and feasibility separately redirected effort towards arrival scheduling, peak registration capacity, and dispensary workflow, all within our control. The experience mirrors that of Krishanth et al. [6], whose nominal group exercise at Lady Ridgeway Hospital similarly surfaced actionable items alongside structural ones.

Second, the gains appear to have come from redistributing demand and adding targeted capacity rather than from working faster. The flattened arrival peak, the effect of one extra registration desk for two morning hours, and dispensary pre-packing all point to queue dynamics rather than staff effort as the limiting factor — the same conclusion reached by the NHSL queuing analysis nearly a decade ago [8]. Consultation time, already short at 3.4 minutes, did not change, which we regard as a necessary balancing measure: a waiting-time project that shortens consultations has merely shifted the cost onto quality of care.

Third, sustainability is not yet proven. Our run chart shows the improvement holding for 4 weeks after the last cycle, but Albalawi et al. [18] are blunt that Lean gains erode without continued management attention. We have tried to build the changes into routine: the huddle is part of the MOMC's daily schedule, the token system is owned by the pharmacy, and a repeat audit is planned at 12 months. Whether the gains survive a change of MOMC or a dengue-season surge is an open question.

The study has clear limitations. It used a pre/post design without a concurrent control, so we cannot exclude secular trends such as falling attendance, seasonal variation, or a Hawthorne effect among staff who knew they were being observed. The COVID-era comparison from Homagama shows how strongly patient load alone can move waiting times [11], and we did not adjust for clinic attendance between the two audit periods. Observation was confined to weekday mornings, the sample was modest, follow-up was short, and the KII panel numbered only 12 informants from one institution. The results come from a single medical clinic and are best read as a worked example, not as national estimates. To our knowledge, however, completed audit cycles of this kind remain rarely reported from Sri Lankan secondary care, and we offer the detail — methods, scores, and run chart — so that similar teams can adapt what is transferable.

7. Conclusion

Waiting time in government clinics is often treated as an immovable fact of Sri Lankan health care. Our experience suggests otherwise. A structured baseline audit, honest prioritisation with the people who run the clinic, and three inexpensive changes cut the average patient's wait by three quarters of an hour and reduced the proportion waiting over 90 minutes from nearly two thirds to about one fifth. None of this required technology or new posts. The harder test lies ahead: sustaining the gain, and extending the approach to the hospital's other clinics.

Compliance with ethical standards

Disclosure of conflict of interest

All authors declare that they have no conflict of interest.

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