Effectiveness of Wait Time Targets and Patient Satisfaction Feedback in Decreasing Wait Times for Prescription Services in an Outpatient Pharmacy

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ABSTRACT

Background: Long wait times for prescription services at the Outpatient Pharmacy of the Dr. OEN SOLO BARU Hospital in Indonesia have led to high numbers of complaints. In response, to decrease these wait times, the hospital undertook an intervention to determine wait time targets and provide feedback on patient satisfaction to personnel in the Outpatient Pharmacy.

Objective: To measure the impact of providing wait time targets and patient satisfaction feedback to pharmacists in terms of decreasing wait times for prescription services at the Outpatient Pharmacy.

Methods: This quasi-experimental research study had a single-group interrupted time-series design. Data on wait times and patient satisfaction were collected from "waiting patients". The study participants were 35 employees (6 pharmacists and 29 technicians), and the intervention entailed provision of wait time targets and patient satisfaction feedback to the participants every week for 5 consecutive weeks.

Results: The wait times for prescription services decreased by 11.13 minutes (17%) for compounded prescriptions and by 12.70 minutes (37%) for noncompounded prescriptions. There was a significant change in average wait time for both compounded and noncompounded prescription services from week 0 to week 4 ($p < 0.001$). There was also a significant change in patient satisfaction from week 0 to week 4 ($p < 0.001$). Patient satisfaction increased significantly in conjunction with the decrease in wait times for prescription services.

Conclusions: The intervention of providing wait time targets and feedback on patient satisfaction to pharmacists helped to reduce wait times for prescription services.

Keywords: wait times, targets, patient satisfaction, feedback, PDCA (plan, do, check, act) method

RÉSUMÉ

Contexte : Les longs délais d'attente pour les services de délivrance de médicaments sur ordonnance à la pharmacie ambulatoire de l'Hôpital Dr. OEN SOLO BARU en Indonésie ont donné lieu à un nombre élevé de plaintes. En réponse, afin de réduire ces temps d'attente, l'hôpital a cherché à déterminer des objectifs de temps d'attente et à fournir des commentaires sur la satisfaction des patients au personnel de la pharmacie ambulatoire.

Objectif : Mesurer l'incidence, sur le temps d'attente pour la délivrance de médicaments sur ordonnance à la pharmacie ambulatoire, de la remise aux pharmaciens d'objectifs de temps d'attente et de commentaires sur la satisfaction des patients.

Méthodes : Cette étude de recherche quasi-expérimentale était conçue selon une série temporelle interrompue à groupe unique. Les données sur les temps d'attente et sur la satisfaction des patients ont été recueillies auprès des « patients en attente ». Au total, 35 employés (6 pharmaciens et 29 techniciens) ont participé à l'étude, et l'intervention consistait à remettre aux pharmaciens des objectifs de temps d'attente et des commentaires sur la satisfaction des patients chaque semaine pendant 5 semaines consécutives.

Résultats : Les temps d'attente pour les services de délivrance de médicaments sur ordonnance ont diminué de 11,13 minutes (17 %) pour les ordonnances relatives aux préparations magistrales et de 12,70 minutes (37 %) pour les ordonnances relatives aux préparations non magistrales. Une différence significative a été observée entre les semaines 0 et 4 ($p < 0,001$) concernant le temps d'attente moyen pour les services de délivrance de médicaments sur ordonnance relatifs aux préparations magistrales et ceux relatifs aux préparations non magistrales. Une différence significative a également été observée dans la satisfaction des patients entre les semaines 0 et 4 ($p < 0,001$). La satisfaction des patients a augmenté de manière significative parallèlement à la diminution du temps d'attente pour les services de délivrance de médicaments sur ordonnance.

Conclusions : La remise aux pharmaciens d'objectifs en matière de temps d'attente ainsi que de commentaires sur la satisfaction des patients a permis de réduire les temps d'attente des services de délivrance de médicaments sur ordonnance.

Mots-clés : temps d'attente, objectifs, satisfaction des patients, commentaires, méthode PDCA (planifier, faire, vérifier, agir)

INTRODUCTION

The wait time for prescription services is the interval from the time a patient submits a prescription until the patient receives the drug from the pharmacist. The standard wait times for prescription services set by the Indonesian Ministry of Health are 30 minutes for noncompounded drugs and 60 minutes for compounded drugs.[1] However, in 2021, the average wait times for prescription services at the Outpatient Pharmacy of the Dr. OEN SOLO BARU Hospital were 37 minutes for noncompounded drugs and 73 minutes for compounded drugs.

Customer dissatisfaction can result in long-term losses; for example, there may be a decrease in repeat visits from existing customers, and customers may mention their dissatisfaction with the organization's services to others. Therefore, reducing wait times can be an important concern for organizations that aim to provide superior services.[2] In terms of the provision of services, motivation has a significant effect on employee performance.[3] The application of rewards typically has a positive effect and can improve employee performance. The presence of goals can also benefit performance, although setting easy goals results in the worst performance, whereas setting difficult yet realistic goals can lead to the best performance.[4] The literature shows that interventions like performance feedback and goal setting have improved customer service behaviour.[3,4] Accordingly, hospital managers try to reduce wait times as a way to provide better customer service.[2]

In a study conducted by Slowiak and others in 2008, an intervention involving a targeted reduction in wait time and provision to pharmacy employees of feedback on patient satisfaction and average wait times resulted in a 20% reduction in wait time for prescription services at a hospital outpatient pharmacy in Michigan (USA).[5] Several years later, the same author team conducted a follow-up study at the same location[2] and observed shorter wait times for prescription services, higher patient satisfaction, and greater consistency of pharmacy employee performance than in the earlier study.

In the current study, we attempted to replicate the research conducted by Slowiak and others[2,5] by targeting a reduction in wait time while providing feedback on patient satisfaction and average wait times for prescription services to employees of the Outpatient Pharmacy at our hospital. The study objective was to find solutions to support reductions in wait time for prescription services and increases in patient satisfaction with Outpatient Pharmacy services.

METHODS

The study protocol was approved by the Medical and Health Research Ethics Committee of the Faculty of Medicine, Public Health, and Nursing, Gadjah Mada University (reference number KE/FK/0483/EC/2022).

This quasi-experimental study had a single-group interrupted time-series design.[6] The intervention consisted of a combination of setting wait time targets and providing patient satisfaction feedback to employees of the Outpatient Pharmacy. Data were observed and collected for 5 consecutive weeks after consent was obtained from the employees.

The study participants were all of the employees in the Outpatient Pharmacy (6 pharmacists and 29 technicians). For measuring patient satisfaction and wait times for outpatient prescription services, a sample of 100 prescriptions was obtained each week using the Slovin formula, consisting of 46 prescriptions for compounded products and 54 prescriptions for noncompounded products. Patients whose prescriptions were selected for analysis of wait times were asked to provide satisfaction ratings. A stratified random sampling method was used to obtain prescription and patient satisfaction samples.

The dependent variables were wait times and patient satisfaction, the independent variable was the target for reducing wait time, and the PDCA (plan, do, check, act) method was applied. Prescription and wait time data were obtained from the hospital information system used in the Outpatient Pharmacy, patient satisfaction data were collected with a survey form, and a PDCA sheet was used to record steps in the process.

A bivariable analysis was conducted to examine the effect on wait times for outpatient prescription services of setting a target for reduced wait times and providing patient satisfaction feedback to employees. The Kolmogorov–Smirnov and Shapiro–Wilk tests were used to analyze the normality of wait times for prescription services and patient satisfaction data. If the data were not normally distributed, then the Mann-Whitney U test was used for statistical analysis. Linear regression was used to determine whether there was a relationship between patient satisfaction and wait time for prescription services. The 95% confidence interval was used, with a significance level of 5% ($p < 0.05$), and the analyses were conducted with SPSS version 17.0 software (IBM).

Statistical tests were conducted to compare the wait time data as follows: week 0 versus week 1, week 1 versus week 2, week 2 versus week 3, week 3 versus week 4, and week 0 versus week 4.

PDCA Method for Wait Time Target

This study used the PDCA method to determine the target wait times for compounded and noncompounded prescription services at the Outpatient Pharmacy. During week 0 (April 25–30, 2022), the average wait times for compounded and noncompounded prescription services were collected. For each subsequent week of the study, a target was set for improvement in wait times, based on simulations and joint meetings involving the head of the Pharmacy Installation and Outpatient Pharmacy personnel. Details of the PDCA method as applied in this study are shown in Table 1.

TABLE 1 (Part 1 of 2). Activities Planned and Completed over the 4-Week Intervention Period, According to the PDCA Method

Timeframe and Step	Activities
Week 1	
Plan	1. Improve the process of receiving prescriptions by adding 1 computer in the reception area for prescriptions, for a total of 3 devices. 2. Expand the Outpatient Pharmacy room. 3. Set the work schedule for technicians in the Outpatient Pharmacy according to activities in the general flow of patient prescriptions. 4. The target for reducing wait time was 10 minutes.
Do	1. Computer was added in week 1. 2. Outpatient Pharmacy room was renovated in week 1. 3. Work schedule for technicians in the Outpatient Pharmacy was changed in week 1.
Check	1. Record and monitor the processes of receiving prescriptions, renovating the room, and setting the technician work schedule, according to the plan for week 1. 2. Record wait time data for prescription services in week 1. 3. Record level of patient satisfaction in week 1.

Act	1. The decrease in wait time that occurred in week 1 was attributed to the increase in number of computers in the reception area (to a total of 3) and the new technician schedule, based on the flow for outpatient prescription services; these approaches were designated as standard practice.
	2. The target for reducing wait time in week 1 was not achieved, so new ideas were identified for week 2, as follows:
	  a. Arrange the schedule for technicians in the Inpatient Pharmacy so that someone is assigned (seconded) to the Outpatient Pharmacy for the period 0900–1200 (peak hours) every day from Monday to Saturday.
	  b. Create a poster showing the flow for processing general outpatient prescriptions.
	  c. Add speakers at the prescription reception counter (to overcome sound restriction created by acrylic barrier at the counter).

Week 2	
Plan	1. Arrange the schedule for technicians in the Inpatient Pharmacy so that someone is assigned (seconded) to the Outpatient Pharmacy for the period 0900–1200 (peak hours) every day from Monday to Saturday, to assist in documentation of notes. 2. Create a poster showing the flow for processing general outpatient prescriptions, and post it in the prescription reception area. 3. Add speakers at the prescription reception counter. 4. The targets for reducing wait times were 4 minutes for compounded prescriptions and 1 minute for noncompounded prescriptions.
Do	1. The schedule for technicians in the Inpatient Pharmacy was arranged during week 2 so that someone would be assigned (seconded) to the Outpatient Pharmacy for the period 0900–1200 (peak hours) every day from Monday to Saturday. 2. A poster showing the flow for processing general outpatient prescriptions was created and posted in the prescription reception area during week 2. 3. Speakers were added at the prescription reception counter during week 2.
Check	1. Record and monitor the processes for setting the inpatient technician work schedule, making posters to show the flow for processing of outpatient prescriptions, and adding speakers at the prescription reception counter, according to the plan for week 2. 2. Record wait time data for prescription services in week 2. 3. Record level of patient satisfaction in week 2.

Act	1. The decrease in wait time that occurred in week 2, specifically for noncompounded prescription services, exceeded the target, such that setting the inpatient technician schedule, using posters for outpatient prescription flow, and adding speakers at the prescription reception counter were designated as standard practice.
	2. The target for reducing wait time for compounded prescriptions in week 2 was not achieved, so new ideas were identified for week 3, as follows:
	  a. Arrange the cashier's schedule in the Outpatient Pharmacy to ensure the presence of additional staff from the main cashier office for the period 0900–1200 (peak hours) every day from Monday to Saturday (to be coordinated with the head of finance).
	  b. Rotate technicians from the drug warehouse to the Outpatient Pharmacy for the period 0900–1200 (peak hours), to work as drug dispensing personnel.

Timeframe and Step	Activities
Week 3	
Plan	1. Improve the process for compounded drugs to avoid the need for patients to wait for a cashier when they have already paid, by setting the cashier's schedule in the Outpatient Pharmacy to ensure the presence of additional staff for the period 0900–1200 (peak hours) every day from Monday to Saturday (in coordination with the head of finance). 2. Rotate technicians from the drug warehouse to the Outpatient Pharmacy for the period 0900–1200 (peak hours), to work as drug dispensing personnel. 3. The target for reducing wait time was 2 minutes.
Do	1. Schedule for cashiers in the Outpatient Pharmacy was adjusted during week 3 to ensure the presence of additional staff from the main cashier office for the period 0900–1200 (peak hours) every day from Monday to Saturday (coordinated with the head of finance). 2. Rotation of technicians from the drug warehouse to the Outpatient Pharmacy for the period 0900–1200 (peak hours), to work as drug dispensing personnel, was instituted in week 3.
Check	1. Record and monitor the processes for setting the cashier's work schedule in the Outpatient Pharmacy and setting the drug warehouse technicians' work schedule, according to the plan for week 3. 2. Record wait time data for prescription services in week 3. 3. Record level of patient satisfaction in week 3.

Act	1. The decrease in wait time that occurred in week 3, specifically for compounded prescription services, met the target, such that setting the schedules for the Outpatient cashier and the drug warehouse technicians (to serve as compounding pharmacists) was designated as standard practice.
	 2. The target for reducing wait time for noncompounded prescriptions in week 3 was not achieved, so new ideas were identified for week 4, as follows:
	   a. Reorganize drug storage in the Outpatient Pharmacy according to speed of product turnover (i.e., fast-moving or slow-moving).
	   b. Develop an alert system to flag when stock reaches minimum buffer.
	   c. Store new brands of drugs to be substituted for old brands on the same shelf as the old brands, to facilitate product searching.
	   d. Arrange for clinical pharmacists to assist in the Outpatient Pharmacy from 1000 to 1200 (within peak hours).

Week 4	
Plan	1. Reorganize drug storage in the Outpatient Pharmacy according to speed of product turnover (i.e., fast-moving or slow-moving). 2. Develop an alert system to flag when stock reaches minimum buffer. 3. Store new brands of drugs, to be substituted for old brands, on the same shelf as the old brands, to facilitate product searching. 4. Arrange for clinical pharmacists to assist in the Outpatient Pharmacy from 1000 to 1200 (within peak hours). 5. The target for reducing wait time was 1 minute.
Do	1. Drug storage in the Outpatient Pharmacy was reorganized during week 4 according to speed of product turnover (i.e., fast-moving or slow-moving). 2. A system for identifying when the stock reached the minimum buffer was set up in week 4. 3. Storage of new brands of drugs, to be substituted for old brands, on the same shelf as the old brands was instituted in week 4. 4. Arrangements were made during week 4 for clinical pharmacists to assist in the Outpatient Pharmacy from 1000 to 1200 (within peak hours).
Check	1. Record and monitor the processes of managing drug storage, identifying when drug stock reaches the minimum buffer, storing new brand drugs on the same shelf as the old brands, and scheduling clinical pharmacists, according to the plan for week 4. 2. Record wait time data for prescription services in week 4. 3. Record level of patient satisfaction in week 4.

Act	1. The decrease in wait time that occurred in week 4, specifically for compounded prescription services, met the target, such that drug storage arrangements, identifying when stock reaches the minimum buffer, storing new brands of drugs on the same shelf as the old brands, and setting the schedule of clinical pharmacists were designated as standard practices.
	 2. The target for reducing wait time for noncompounded prescriptions in week 4 was not achieved, so new ideas were identified for the next week, as follows:
	   a. Add a pneumatic tube to connect the Outpatient Pharmacy and the drug warehouse.
	   b. Approach the 6 specialist doctors who are still using hand-written prescriptions to gauge their willingness to adopt electronic prescriptions.

PDCA = plan, do, check, act.

RESULTS

Wait Times for Prescription Services

The Shapiro–Wilk test showed that wait time data for compounded prescriptions were not normally distributed ($p < 0.05$). Similarly, the Kolmogorov–Smirnov test showed that wait time data for noncompounded prescriptions were not normally distributed ($p < 0.05$). On this basis, it was determined that comparisons of average wait times, both week by week and for week 0 versus week 4, should be tested with the Mann–Whitney U statistic.

From week 0 to week 4, the average wait time for compounded prescription services decreased by 17% (from 63.93 to 52.80 minutes [Table 2]; $p < 0.001$ [Table 3]).

Over the same period, the average wait time for noncompounded prescription services decreased by 37% (from 33.90 to 21.20 minutes [Table 2]; $p < 0.001$ [Table 3]).

Patient Satisfaction

The results of the patient satisfaction survey (Figure 1) involved nonparametric data, so the Mann–Whitney U test was again used for statistical comparisons, both week by week and for week 0 versus week 4.

For compounded prescription services, there was a significant change in patient satisfaction from week 0 to week 4 ($p < 0.001$), but patient satisfaction did not differ significantly in the week-by-week analysis (Table 4).

For noncompounded prescription services, there was a significant change in patient satisfaction from week 1 to week 2 ($p = 0.009$), as well as a significant change from week 0 to week 4 ($p < 0.001$), but all other differences were nonsignificant (Table 4).

DISCUSSION

Wait Times

From baseline (week 0) to week 1, the interventions of adding a computer at the prescription reception counter, setting a schedule for outpatient technicians, and expanding the Outpatient Pharmacy room contributed to decreasing wait times by 6.43 minutes (10%) for compounded prescriptions and 9.12 minutes (27%) for noncompounded prescriptions, both of which were statistically significant. The reductions in wait time from week 0 to week 4 were also statistically significant, because the accumulation of improvements from week 1 to week 4 resulted in overall decreases in wait

TABLE 2. Wait Times for Prescription Services

Timeframe	Target Wait Time (min) C	Target Wait Time (min) NC	Observed Wait Time (min) Average C (n = 46)	Observed Wait Time (min) Average NC (n = 54)	Observed Wait Time (min) Median C (n = 46)	Observed Wait Time (min) Median NC (n = 54)	Observed Wait Time (min) Range C (n = 46)	Observed Wait Time (min) Range NC (n = 54)
Week 0	–	–	63.93	33.90	63	32.5	38–101	23–56
Week 1	54	24	57.50	24.78	58	25	24–85	6–36
Week 2	54	24	56.13	22.28	56	23.5	26–85	6–36
Week 3	54	20	53.70	21.50	51.5	20	18–89	10–43
Week 4	53	20	52.80	21.20	54	20	25–98	7–39

C = compounded products, NC = noncompounded products.

TABLE 3. Comparison of Wait Times for Prescription Services for Compounded and Noncompounded Products

Comparison	Compounded Products Difference in Average Wait Time (min)	Compounded Products p Value[a]	Noncompounded Products Difference in Average Wait Time (min)	Noncompounded Products p Value[a]
Week 0 vs week 1	6.43	0.008	9.12	< 0.001
Week 1 vs week 2	1.37	0.30	2.50	0.07
Week 2 vs week 3	2.43	0.30	0.78	0.47
Week 3 vs week 4	0.90	0.93	0.30	0.56
Week 0 vs week 4	11.13	< 0.001	12.70	< 0.001

[a]Mann–Whitney U test.
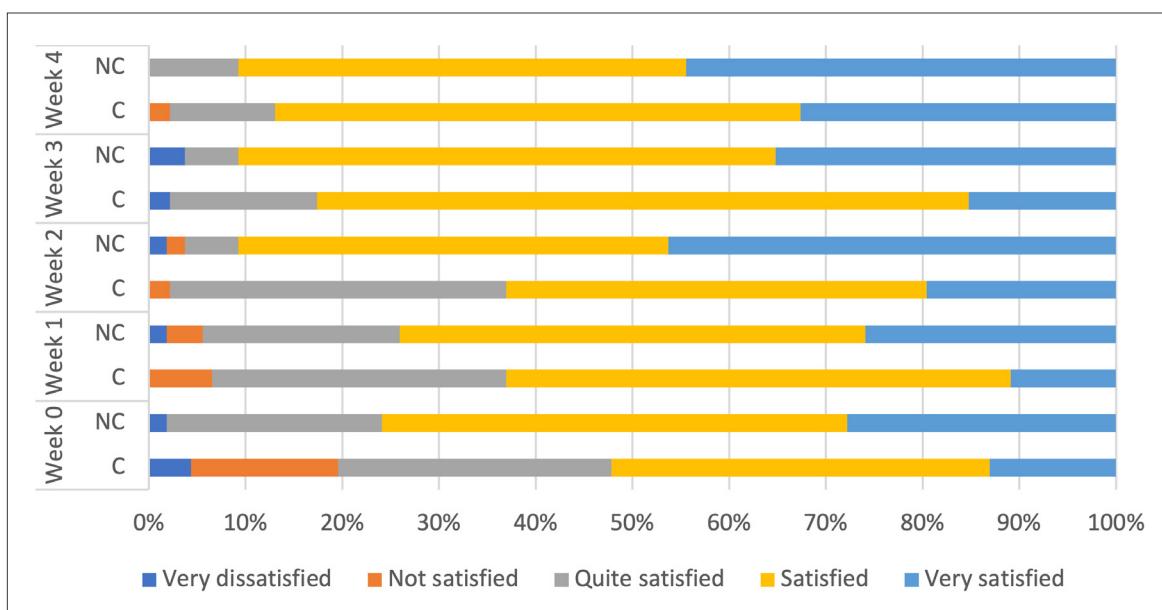
FIGURE 1. Results of patient satisfaction survey, based on a total of 100 prescriptions randomly selected during each week of the study. C = compounded products (*n* = 46 prescriptions each week), NC = noncompounded products (*n* = 54 prescriptions each week).

TABLE 4. Comparison of Patient Satisfaction with Prescription Services for Compounded and Noncompounded Products[a]

Comparison	Product Type; *p* Value[b]	
	Compounded	Noncompounded
Week 0 vs week 1	0.26	0.73
Week 1 vs week 2	0.53	0.009
Week 2 vs week 3	0.25	0.31
Week 3 vs week 4	0.09	0.38
Week 0 vs week 4	< 0.001	< 0.001

[a]See Figure 1 for patient satisfaction data.
[b]Mann–Whitney *U* test.

time of 11.13 minutes (17%) for compounded prescriptions and 12.70 minutes (37%) for noncompounded prescriptions.

At the study hospital, the PDCA cycle will be continued as long as the target wait times have not been achieved. In this regard, the better the feedback on the effectiveness of a given intervention, the more ideas for better solutions that are expected to emerge. In this situation, greater benefits are likely to occur with an implementation process that is repeated many times.[7]

Patient Satisfaction

For compounded prescription services, patient satisfaction increased significantly from baseline (week 0) to week 4 because of a decrease, by 8 patients (17%), in the number of patients who were dissatisfied or very dissatisfied with these services. At the same time, there was a corresponding increase, by 8 people (17%) in the number of patients who were quite satisfied, satisfied, or very satisfied with compounded prescription services.

For noncompounded prescription services, patient satisfaction increased significantly from week 1 to week 2 because of a decrease, by 1 person (2%), in the number of patients who were dissatisfied or very dissatisfied with these services. At the same time, there was an increase, by 11 people (20%), in the number of patients who were very satisfied with noncompounded prescription services. From baseline (week 0) to week 4, patient satisfaction with noncompounded prescription services increased significantly because of an increase, by 9 people (17%), in the number of patients who were very satisfied with these services.

There was a negative correlation between wait times for prescription services and patient satisfaction. In other words, the shorter the wait time for prescription services, the higher the level of patient satisfaction. The results of linear regression analysis between wait times for prescription services and level of patient satisfaction were statistically significant, implying a causal relationship between these 2 variables. This finding is in accordance with the results of a previous study in which patient satisfaction increased with short wait times for drug preparation.[8]

Limitations

This study was based on an analysis of electronic prescriptions only; it did not include handwritten prescriptions in the Outpatient Pharmacy. In addition, the demographic

and clinical characteristics of patients who completed the satisfaction survey were not analyzed.

CONCLUSION

The interventions of setting wait time targets and providing patient satisfaction feedback to pharmacists were supporting solutions for reducing wait times for prescription services at the Outpatient Pharmacy.

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