MEDICATION STOCKPILING: A RED ALERT TO COMBAT FOR QUALITY, SAFETY, AND EFFICACY OF MEDICATIONS

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Abstract

Medication Stockpiling (MS), in the Ministry of Health, Malaysia, resulted in the disposal of MYR 2 million worth of expired or spoilt medicines between 2014 and 2016. MS is an alarming issue that causes healthcare resources wastage and potentially harmful and toxic to patients. This study aimed to reduce MS in Hospital Selama, beginning with the medical wards within one year.

A situational analysis from the year 2013 to 2014 showed a 9.4% increase in MS. A four-month pre-intervention study from November 2014 to February 2015 revealed a 28% MS. The standard of the study was set based on the team members' consensus. The aim was to reduce 50% of MS after four-month of intervention. The cause-effect analysis identified the main contributing factors of MS. The questionnaire was distributed to nurses in the wards and pharmacists to pinpoint the MS antecedent. The results indicated a lack of routine ward audit by the clinical pharmacists, over-indent by ward nurses and oversupply by the pharmacy unit. A flow-chart of the good care process comprises the steps of medications indent and supply was developed. It involved assigning the nightshift nurses for checking and indenting the wards' medication stock, developing the ward stock indent (WSI) form, ensuring the pharmacy staff supply sufficient medication and enforcing a monthly ward audit by the clinical pharmacists and cross-audit by other pharmacists. Each indicator in the model of good care was then measured.

The post-intervention period successfully achieved a 3.5% MS; an 87.5% reduction (exceeded the target). Additionally, a cost reduction in the medication wastage from MYR 1,273.97 to MYR 654.44 was noted. The study successfully achieved less than 6% of MS from 2015 to 2018.

In conclusion, the study facilitated a successful collaboration among the hospital different units towards MS reduction.

KEYWORDS: Medication stockpiling, medication wastage, quality study

Problem

Medication stockpiling (MS) is the inappropriate accumulation of medication to prevent a shortage of medications when needed. Routine quarterly ward-check reports by pharmacists showed that almost all units kept excess medications for after office hour use. Extra workforce and time were needed to screen all the returned, unused medications to determine if they were still re-dispensable or re-usable by considering proper storage and expiry date. MS has been highlighted as a serious issue when a situational analysis in two medical wards of Hospital Selama showed an increase of 9.4% MS, from 40% (Year 2013) to 49.4% (Year 2014). It triggered a red alert when two fast-moving medications; Amoxycillin capsule and Captopril tablet were found expired in the ward due to MS. This has led to medication wastage and caused ineffective treatment or toxic effect to patients.

Hospital Selama is a district, non-specialist hospital located in Selama, Perak, a state in the northern part of Peninsular Malaysia. It served a population of approximately 300,000 people. It consisted of three wards, namely Male, Female and Pediatric, and Obstetrics and Gynaecology (O&G) Ward, giving a total of 90 beds. The hospital`s bed occupancy rate (BOR) ranged from 35% to 45%. Other units include the Emergency Unit, Outpatient Unit, Pathology Service Unit, Physiotherapy and Rehabilitation Unit, Pharmacy Unit, Hemodialysis Unit, and others. Pharmacy is one of the critical clinical support units with the role of thoroughly screening prescriptions, filling, dispensing of medications, suggesting recommendations or interventions, and counselling the patients. Pharmacists are imperative to ensure medication safety, quality, and efficacy by safeguarding the precise choice of drug, dose, frequency, duration of medication. They also ensure no contraindication, polypharmacy, and drug-drug interaction for the patients. Operational hours of the Pharmacy Unit started from 8 am to 5 pm, and any emergency cases are handled by the on-call pharmacist. Ward Supply Pharmacy Unit (WSPU) consisted of a pharmacist and a pharmacist assistant, in charge of supplying the ward stock medications to all units. Each medical ward is made up of 15 to 20 ward staff, and one of the ward staff's responsibilities is to indent the ward stock medications. Each ward kept up to approximately 80 types of medications.

Although the initial verification phase of the problem indicated only 9.4% MS, the percentage of MS during the four months pre-intervention period study of November 2014 to February 2015 was 28%. The figures highlighted the urgent need to solve this problem and thus, upon a consensus among the group members, this study was formulated aiming to achieve a 14% MS (a 50% reduction) by the end of the one-year study.

Background

According to The Academy of Manage Care Pharmacy (AMCP), MS is an expensive, unnecessary, wasteful, and potentially dangerous circumvention of appropriate healthcare resources (1). The disposal of expired medications had been a concern in many countries as proper and safe disposal were costly (2). On the other hand, if disposed of improperly, the waste may enter the ecosystem, negatively impacting on human health and the environment (2). The Stars Online reported that the Ministry of Health Malaysia had disposed nearly MYR 2 million worth of expired or spoilt medicines over a two-year period, from 2014 to 2016 (3). The report stated that most of the expired medicines were stockpiled by patients and returned to government pharmacies under the Ministry's "Return Your Medicines" program. Total medication disposed of in 2014 was worth MYR 1.8 million, which equaled to 0.075% of the budget of the year (3). This is an alarming issue as MS led to medication and financial wastage.

A study conducted in Gondar University, a teaching and specialist hospital in Ethiopia, showed that expired medications increased toxicity risk as the active ingredient of medication underwent degradation and might lead to the formation of toxic products (4). This endangered patients' health.

Besides, MS for extended periods may reduce the drug potency as the storage was beyond the manufacturer's recommendations. The poor storage condition where medications were exposed to heat, light, humidity, and air may cause the medication to lose its potency. Moreover, MS may also cause a shortage of medications in the drug distributing system (5). The disruption in the supply chain can significantly decrease the quality of service and care provided to patients, affect the patients' satisfaction and their well-being. In conjunction with the application of Government Service Tax (GST) in 2015, the budget allocated for purchasing medication in the government sectors was reduced by 2.58%, or MYR 3.1 million (6). Despite the hike in the number of patient visits to government facilities by 20%, the budget allocation was continuously decreased in trend by 9.28% as noted in the 2016 Budget and was further reduced to 3.78% in 2017 (6). This caused the populations to have a negative perception or assumption of drug shortages due to budget cuts. The Ministry of Health holds the ground that the government health facilities were not facing a shortage of fund whilst encouraging staff of the government sectors to work around the budget constraint. The situation can be improved by seeking for innovative cost-saving effort, one of which is by reducing MS and ensuring systematic ward stock management system. Reducing MS would allow short expiry medications to be offered to other hospitals or clinics on time for patients use, and the amount of expired medications and cost for proper drug disposal can be reduced.

The University of Huddersfield conducted a study that aimed at identifying the root causes contributing to medication wastage in a hospital pharmacy in the UK and its potential solutions (7). The results of the study revealed that most medication wastages happened in the ward. The root cause of medication wastage was most likely due to unknowingly expiring stockpiled medications as pharmacists failed to perform routine ward checks and tended to supply whatever amount of medications requested by the ward staff (7). Moreover, another important cause was the unnecessary stock ward holding by ward staff. Ward staff might not realize the actual value of the medications kept in the ward, failed to return the excessive medicines to the pharmacy, requested more medications than necessary, and operated a 'just in case' system. In addition, staff in the ward might not perform stock ward checking accordingly or check the expiry date of medications routinely. Last but not least, poor communication between staff ward and pharmacists might also lead to MS and medication wastage.

The study in the UK came up with solutions that emphasising on ward staff inspecting their own ward's medication stock and checking the expiry date to ensure no expired medications in the ward (8). Besides, ward staff should return the excessive medication after a patient was discharged or deceased to the pharmacy on the same day during office hour or early the next day. A series of facilitated workshop or seminars on the Standard Operating Procedures (SOPs) or the process of care and improved communication among the units were also the solutions to this issue.

An international survey in the Netherlands highlighted that pharmacists had some essential roles in reducing medication wastage throughout the pharmaceutical supply chain (7). In the survey, 86.4% of nineteen developed countries reported stock ward management as the most frequently implemented activity to reduce medication waste. Thus, pharmacists play an essential role in the whole process of medicine usage, from avoiding unnecessary supply to recycling medicines that were no longer needed.

Measurement

The primary outcome of this study is the percentage of MS. It is calculated as the quantity of unused medication return (MR) over the total quantity of medication supplied. The quantity is irrespective of the types of medications. For example, if the medication returned consists of two vials of Ceftriaxone injection, three tablets of Bisoprolol tablet

5mg and four bottles of Cloxacillin syrup, the quantity counted for unused MR is nine. Initial data collection involved only two medical wards (Male Ward and Female and Paediatric Ward). All oral and injection medicines supplied to medical wards were included. Data were collected daily at the WSPU through ward stock indent (WSI) form and the pharmacy MR record. Pharmacists or pharmacist assistants of the WSPU counted the quantity and cost of MR from each ward every month and identified the medication that could be reused. A pre-intervention study showed 28% MS within a four-month period, starting from November 2014 to February 2015. A 50% reduction of MS is aimed to be achieved at the end of this study.

Initial Assessment of the Problem

After reviewing the current process of care of drug indent and supply to the ward (Figure 1), the critical steps that aided in reducing the percentage of MS were listed out. First, night shift ward nurses were responsible for the indent of ward stock medications. They must check all medications kept in the ward and identify the types and quantity of medications that have reached below the minimum level of ward stock. The minimum level of ward stock is the minimum quantity of medications that must be kept in the ward that is sufficient to spare for after office hour use. Also, they must return the excessive medications, if any, or exchanged medications with short expiry. Short expiry medications are medications that will be expired in one week based on the expiry date. Then, the WSI form must be duly filled before submitting to WSPU. The WSI would be updated from time to time accordingly upon the request of the ward's nursing manager and after a discussion with the pharmacist-in-charge.

Next, the pharmacist or assistant pharmacists in WSPU must supply the correct quantity of medications to avoid exceeding the maximum level of ward stock level and ensure all medication supply were labelled, in good condition and unexpired. The ward nurses working in morning shift would countercheck the medications supplied and collected back to the ward and place the ward stock (WS) medications into their respective shelves systemically.

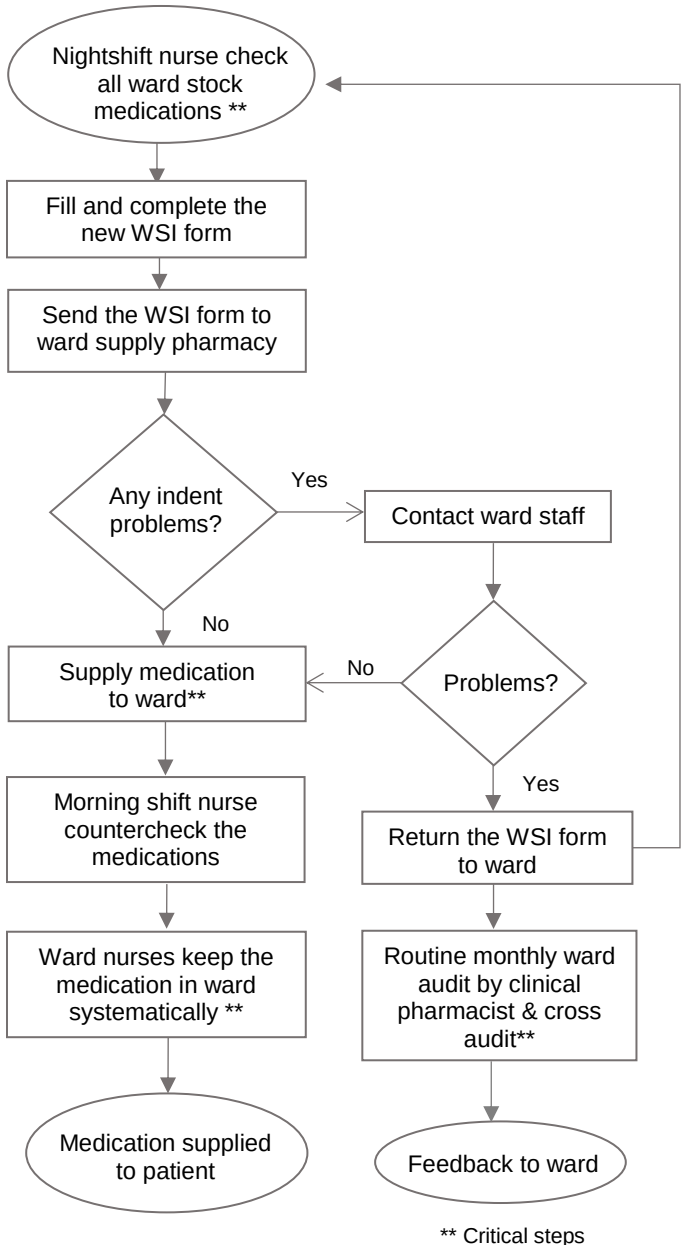


Figure 1: Flow-chart of process of care on drug indent and supply.

Besides, clinical pharmacist units also lend cooperation to reduce MS. All clinical pharmacists in charge of the respective wards must carry out routine monthly ward audit to inspect the ward stock medications. Audit marks are deducted for any expired medications, improper storage of medications, medications that fall below minimum quantity, or excessively stored medications. The audit report would then be forwarded to the nursing manager for his or her attention. A routine cross audit would be conducted by other pharmacists every three months.

Before suggesting the implementation, a cause and effect analysis technique was performed to analyse the probable contributing factors (Figure 2).

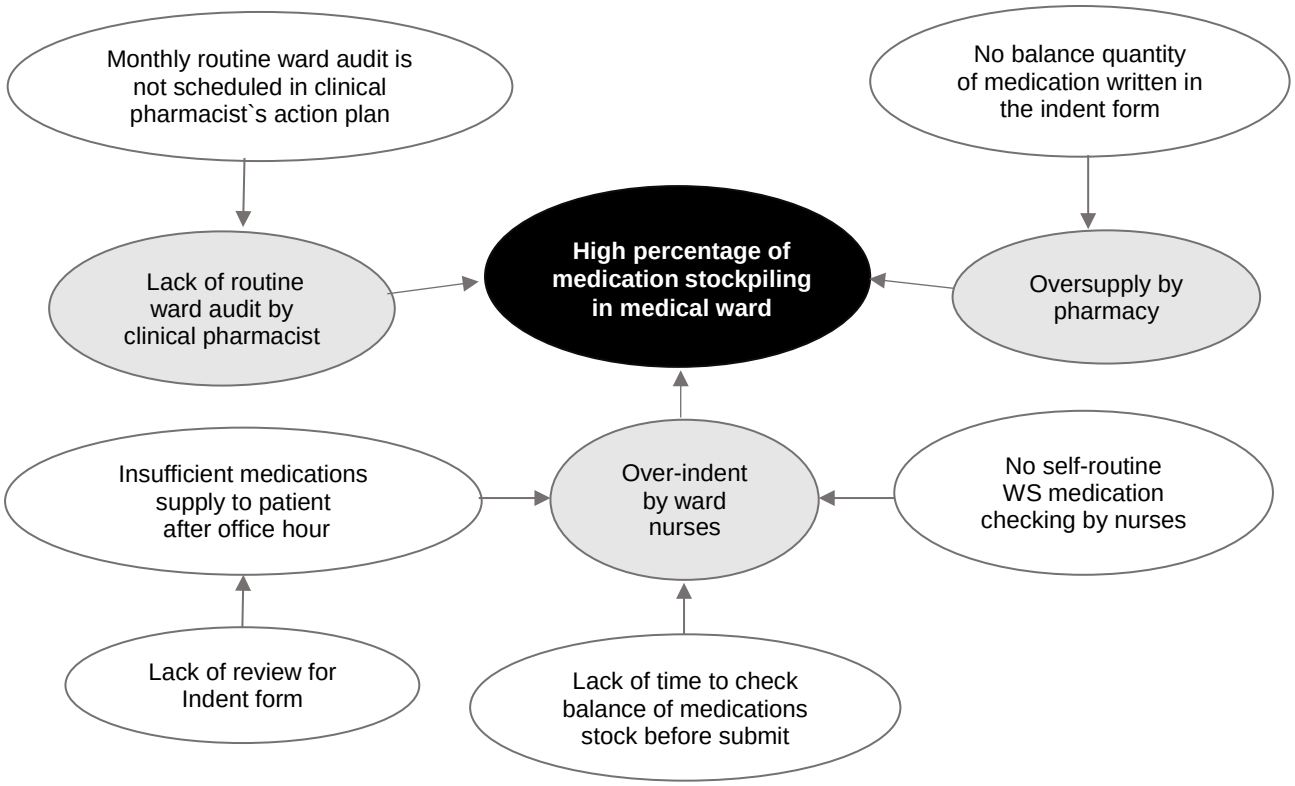


Figure 2: Cause-effect analysis chart of high percentage of medication stockpiling in medical wards.

Two separate sets of questionnaires were developed to identify the factors contributing to MS. One was targeted at nurses, on the reasons of over-indent, whereas the other is for pharmacists on the factors of oversupply. Both the nurses and pharmacists can select more than one reasons from the list in the questionnaire. The main contributing factors were identified by ward nurses (n=30) namely lack of time to check stock balance before indent (80%), insufficient medication to fulfil patients' need after office hours (63%) and no self-routine WS medication checking by nurses (50%).

On the other hand, the questionnaire was distributed to the pharmacists and pharmacist assistants (n=16) to determine the factors of oversupply of medication to the wards and no routine ward audit by the clinical pharmacists. All respondents claimed that the reason for oversupply was because they did not know the quantity balance of medications in the ward. Hence, they tended to supply whatever was requested. All respondents agreed that clinical pharmacist did not perform ward audits because ward audit was not included in the clinical pharmacists' action plan.

Strategy

This study's SMART aim was to reduce the percentage of MS by 50%, from the pre-intervention phase by the end of a 1-year period. Few strategies were implemented, aiming at improving the model of good care in the post-intervention period.

The initial intervention was to tackle the problem of over-indent by ward nurses and supply pharmacy staff who tend to oversupply the medications. A new format of WSI form to replace the previous indent form, which is called *Buku Kimia* was developed. This format was developed in a partnership between the medical ward and ward supply pharmacy staff. The new WSI form consisted of the list of ward stock medications of each ward with the minimum and maximum quantity of medications that are allowed to be kept. There were three additional columns to be filled upon a ward stock indent, namely the quantity of left-over medications, the expiry date of the medications, and the quantity of medications to be indented. The new format of WSI form (as shown in Appendix) was approved to be used in Hospital Selama by the Hospital Director.

Additionally, the schedule of pharmacists, on-call pharmacist and their contact number were distributed to the wards at the beginning of each month. This was done to tackle the problem of over-indent for 'just-in-case' use and to reassure ward staff that stockpiling was unnecessary as an on-call pharmacist was readily available if there is an urgent need for medications.

Besides, the WSI list in each ward was also revised and updated according to the prescribing trends. Ward supply pharmacists allowed the nursing manager to submit the application form to update the WSI list as and when needed instead of making a yearly request. This was done to overcome the problem of over-indent of WS medications, which arise from the lack of medications supply for patients after office hour.

Another intervention was to come up with the SOP of indent ward stock from the pharmacy. The SOP was initially drafted by the head of Ward Supply Unit and then revised by sisters in the ward. This effort aims to compel all ward staff to follow the SOP, which is applicable and agreed by both the ward staff representatives and reduce the over-indent problem of WS medications. The discussion's results also determined that night shift nurse is responsible for doing a routine ward stock check and filling in the WSI form, whereas morning shift nurses are responsible for counterchecking the medications supplied by the ward supply pharmacy and placing them into the corresponding slot systemically according to the 'First In First Out' rules.

Furthermore, clinical pharmacists were obligated to perform a routine audit of WS medications every month. The Head of Pharmacy Department had set the WS medications audit as one of the key performance indicator (KPI) for the pharmacists. This is to solve the problem of clinical pharmacists who did not routinely perform a ward audit, which led to a high

percentage of medication stockpiling. The KPI was set to be 100%. Clinical pharmacists must include ward audit in their tentative action plan, and upon the completion of the ward audit, a report must be sent to the nursing supervisor of the ward. Meanwhile, other pharmacists must take a turn to do a cross-audit on the wards every three months. The head of the ward supply unit arranged the schedule and pharmacists in charge of the cross audit.

In addition, continuous medication education (CME) of the SOP of WS management was provided to all Pharmacy's staff and ward staffs. CME, in collaboration with the nursing unit and ward supply pharmacy unit was carried out twice a year.

Results

The post-intervention analysis indicated that all criteria in the model of good care (Table 1) showed an improvement after the intervention. The post-intervention study revealed an 87.5% reduction of MS, from 28% (November 2014 – February 2015) to 3.5% (July – October 2015). The subsequent monitoring phase (November 2015 – Feb 2019) showed that the MS percentage was sustained around 3.3%, which was higher than the standard set (Figure 3). The yearly MS analysis indicated that MS was reduced from 49.4% (2014) to 5.5% (2015). The total cost of unused medication returned was reduced by 48.6% after the intervention.

In general, all of the approaches implemented were indeed a success. However, the ward audit by pharmacists suggested that there was still a 10% ward stock falling below the minimum level and not indented by ward nurses and 3% of medications were found to have a short expiry date but were not returned to the pharmacy unit. Upon investigation, this was mainly due to two reasons. First, the new ward nurses were not familiar with the WS indent system and SOP. Second, the high workload of the night shift nurses, such as when one of the nurses needed to escort or transfer out a case and has to leave the other staff nurses to be in charge and take care of the patients.

This was overcome by adding the briefing on the WSI system in the echo training checklist for every new staff nurse. Besides, the wards' nursing supervisors had instructed staff nurses of the morning shift to take over the responsibility of checking WS and filling in the WSI form in case the night shift staff nurses are unable to do so due to high workload.

However, the post remedial survey showed that 100% of clinical pharmacists performed the ward stock audit.

Table 1: Model of good care for reducing MS in medical ward.

No	Procedure	Criteria	Standard	Pre-remedial	Post-remedial	February 2019
1	**Night shift nurses identify the types and quantity of WS medications to be indented**	1. Indent WS medications when quantity below minimum level (refer WSI list)	100%	75%	90%	98%
		2. Replace medications that easily change colour due to humidity, e.g. Ascorbic Acid, Cap Phenytoin	100%	86%	100%	100%
		3. Exchange WS medications with short expiry date (at least one week before the expiry date)	100%	80%	97%	100%
		4. Regularly update the WSI list	100%	50%	100%	100%
2	**Pharmacy supply medications to ward**	1. Supply the correct quantity of WS medications and do not exceed the maximum stock level	100%	70%	100%	100%
		2. Supply WS medications that are not expired	100%	100%	100%	100%
		3. Supply each oral tablet of WS medications with label name and expiry date	100%	40%	100%	100%
3	**WS medications are kept systematically in ward**	1. WS medications kept systematically in labelled location by morning shift nurses	100%	50%	95 %	100%
		2. Medication stored according to Standard Operating Procedure in ward	100%	100%	100%	100%
		3. Monthly routine WS medications audit by a clinical pharmacist	100%	25%	100%	100%
		4. Quarterly cross audit by other pharmacists	100%	100%	100%	100%

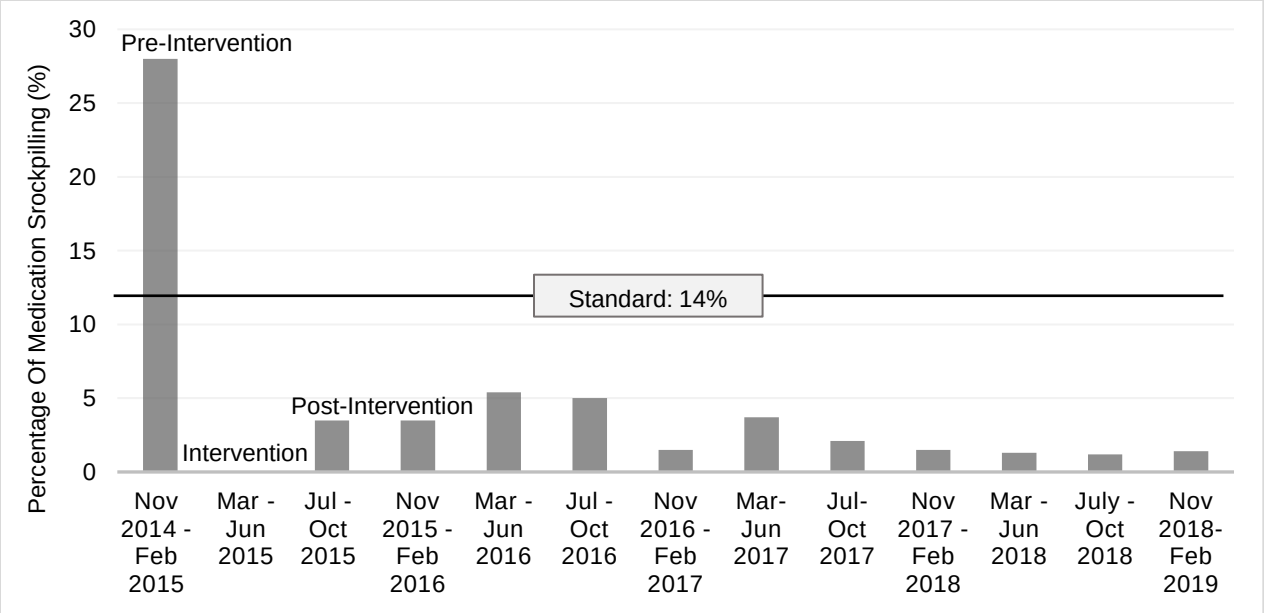


Figure 3: Achievement on percentage of medication stockpiling (ABNA analysis).

Lessons and Limitations

This study showed that the implementation of a systematic WSI system helps to reduce the percentage of medication stockpiling, and it yields a sustainable result. An additional achievement of this study is the cost-saving of medication wastage. During the pre-intervention study, the cost of the medication wastage resulted from medication stockpiling was MYR 1,273.97, but it was reduced to MYR 654.44 during the post-intervention study period, which showed a cost reduction of 48.6%.

Multidisciplinary communication and teamwork are the key success factors of this study. This study would never have achieved its goal without the full support of the hospital director and the commitment from everyone involved, directly or indirectly. Since this study ensured the involvement of all related parties throughout the process, group discussion sessions, and considered the collective views of the team members when designing the WSI system, it yielded a sustainable and user-friendly WSI system.

However, despite the initial enthusiasm, the study encountered several teething problems when the WSI system was extended to other units, such as the Emergency Unit and Outpatient Unit. The most challenging part was that the other units did not have any clinical pharmacist who could assist in the medications monthly audit. Moreover, it was rather difficult to convince the senior staff to embrace the new WSI system as they were so used to the existing deep-rooted routine. Nevertheless, there was a positive change when the impact of the new WSI system to medical wards was presented in multiple presentations, focusing on the reduction of medication wastage and the costs saved.

This study can be applied to other bigger hospitals with 600 beds and BOR >80%. It can be done by implementing the WSI format, which consisted of the column for minimum quantity, maximum quantity, and the medications' expiry date. The types of WS medications stored and the maximum quantity allowed should be tailored accordingly based on the facility. The flow-chart of the process of care can be adopted as well, with minimal revision. There is no doubt that it will result in a higher reduction of MS and a more significant impact on the hospital.

Conclusion and the Next Steps

In conclusion, this study had revealed the contributing factors that might have led to medication stockpiling. Interventions were suggested and implemented in order to tackle each factor. This study had successfully reduced the percentage of medication stockpiling in both medical wards, and the WSI system was then implemented in all other units. The results of MS for both medical wards were presented to the Hospital Director and head of all units. This was done to convince other units to embrace the change as reducing MS brought positive impacts especially in ensuring the quality, safety, and efficacy use of medications. The flow-chart of the process of care for other units was revised accordingly following a discussion with the respective head of unit, taking into account the staff's workload and working schedule.

Continuous efforts and teamwork among the wards, units, and pharmacy unit are critical in order to ensure the sustainability of the interventions. The monitoring of these indicators and the saving of cost are an ongoing process, and prompt actions are to be taken if the percentage of medication stockpiling increased or failed to reach the initial target set. Besides, this study allowed all parties involved to contribute suggestions as a proactive approach in addressing issues promptly to give better outcomes, with the hope of achieving zero medication stockpiling in all units of Hospital Selama. This is further supported by a monthly and quarterly scheduled audit on medications by dedicated pharmacists. Strong support from the Hospital Director continues to motivate this study through yearly conferment of a certificate of achievement to the respective units with the best WSI management. Continuous efforts are underway to sustain and improve the MS results, striving towards achieving a zero-medication stockpiling in all units of this hospital.

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Conflict of Interest

None

Funding

None

References

1. NHS, Reader I, Hazell B, Robson R. Pharmaceutical waste reduction in the NHS. 2015;(June):1–24. Available from: https://www.england.nhs.uk/wp-content/uploads/2015/06/pharmaceutical-waste-reduction.pdf

2. Newman C. How to reduce medicines waste In short Patient ' s own drugs. Pharm J. 2011;1–5.

3. Rahim R. Ministry destroys RM2mil worth of expired meds - Nation | The Star Online. Star Online [Internet]. 2016;1. Available from: https://www.thestar.com.my/news/nation/2016/12/27/ministry-destroys-rm2mil-worth-of-expired-meds/

4. Atinafu T, Takele A, Kassie A, Yehualaw A, Tesfaw G, Desseno T, et al. Unused medications disposal practice: The case of Patients visiting university of Gondar specialized teaching Hospital, Gondar, Ethiopia. Int J Pharm Sci Res. 2014;5(12):999–1005.

5. NHS. Good Medicines Management Clinical Guideline. 2019;(March).

6. Abu Bakar A. Kutipan GST meningkat tetapi bajet ubat semakin mengecil, kata Teo. Free Malaysia Today [Internet]. 2017 Nov 7;1. Available from: https://www.freemalaysiatoday.com/categ

ory/bahasa/2017/11/07/kutipan-gst-meningkat-tetapi-bajet-ubat-semakin-mengecil-kata-teo/

7. Bekker C, Gardarsdottir H, Egberts A, Bouvy M, van den Bemt B. Pharmacists' Activities to Reduce Medication Waste: An International Survey. Pharmacy. 2018;6(3):94.

8. Papalexi M, Breen L. A preliminary examination of the deployment of lean and reverse logistics within the pharmaceutical supply chain (PSC) UK. … Res Netw … [Internet]. 2014; Available from: http://eprints.hud.ac.uk/23230

Appendix

WSI form for Male Ward

SENARAI INDEN UBAT FLOOR STOCK - UBAT LIST A & TROLI KECEMASAN

WAD LELAKI

TARIKH:

BIL	NAMA UBAT	BIL		BIL	EXP DATE	BIL	
		MAX	MIN	BAKI		INDEN	BEKAL
UBAT SUNTIKAN (FLOOR STOCK) - LIST A							
1	Amoxicillin 1g & Clavulanate 200mg inj. **(Augmentin)**	5	2				
2	Ampicillin & Sulbactam 1.5g inj. **(Unasyn)**	5	2				
3	Cefoperazone sodium 1g inj. **(Cefobid)**	5	2				
4	Ceftazidime 2g IM/IV inj. **(Fortum)**	5	2				
5	Ceftriaxone 1g inj. **(Rocephin)**	3	2				
6	Cefuroxime 1,500mg IM/IV inj. **(Zinacef)**	5	2				
7	Diclofenac sodium 75mg/3ml inj.	20	10				
8	Digoxin 0.25mg/ml inj.	5	2				
9	Dobutamine HCL 250mg/20ml inj.	5	2				
10	Isosorbide dinitrate 1mg/ml 10ml inj.	5	2				
11	Metronidazole 500mg/100ml inj.	5	2				
12	Noradrenaline acid tartrate 4mg/4ml inj.	5	2				
13	Omeprazole 40mg inj.	4	2				
14	Streptokinase 1,500,000 IU inj. (*)	2	1				
15	Tramadol HCL 50mg/ml inj.	20	10				
16	Verapamil HCL 5mg/2ml inj.	5	2				
LIST A MISCELLANEOUS							
1	Calcium polystyrene sulfonate powder **(Kalimate)**	10	5				
(*) UBAT TERSEBUT PERLU DISIMPAN DALAM PETI SEJUK (SUHU SIMPANAN : 2°C - 8°C)							
TROLI KECEMASAN							
BIL	**NAMA UBAT**	**BIL**		**BAKI**	**EXP DATE**	**INDEN**	**BEKAL**
1	Adenosine 3mg/ml inj.	5					
2	Adrenaline 1mg/ml inj.	10					
3	Amiodarone 150mg/3ml	10					
4	Atropine sulphate 1mg/ml inj.	5					
5	Aminophylline 2.5% inj.	5					
6	Calcium gluconate 10% 10ml inj.	5					
7	Chlorpheniramine 10mg/1ml inj.	5					
8	Dexamethasone 8mg/ml inj.	5					

9	Dextrose 50% 10ml inj.	5				
10	Dopamine 200mg/5ml inj.	5				
11	Flumazenil 0.5mg/5ml inj.	3				
12	Furosemide 20mg/2ml inj.	10				
13	Heparinised saline 50 IU/5ml inj.	5				
14	Hydrocortisone 100mg inj.	5				
15	Lignocaine HCL 200mg/10ml inj.	5				
16	Naloxone 0.4mg/ml inj. (adult)	3				
17	Phytomenadione BP10mg/ml inj.	5				
18	Promethazine HCL 25mg/ml inj.	5				
19	Sodium bicarbonate 8.4% 10ml inj.	5				
20	Water for injection 10ml	10				

Hospital Selama (Jan 2019)