Retrospective Study on Potential Cost Savings of Medications after Implementation of “Order What You Need” (OWUN) at Labuan UTC Health Clinic

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Abstract

Introduction: "Order What You Need" (OWUN) is an initiative that encourages patients to only collect the medicines they require at the pharmacy. OWUN might help to avoid unnecessary medicine wastage.
Objective: This study aimed to estimate the potential cost savings of medications after the implementation of the OWUN practice at the outpatient pharmacy of Labuan UTC Health Clinic.
Methods: This was a retrospective analysis on the record of OWUN unwanted medicines from April to September 2023. Unwanted medicines referred to medicines that patients or caregivers indicated as not needed during prescription refill at the outpatient pharmacy counter. The cost savings of medications were calculated based on the latest cost prices.
Result: Of 235 patients who joined the OWUN programme, 58% were female, and the mean age was 60.1 ± standard deviation 12.8 years old. A total of 9,572 units of medicines were identified as unwanted, resulting in an estimated cost savings of RM2,636. Medicines from the respiratory group accounted for the highest proportion of cost (41.0%), followed by the endocrine group (27.1%) and the cardiovascular group (17.6%). The three most common unwanted medicines were metformin (40%), atorvastatin (14%) and gliclazide (6%).
Conclusion: The study showed cost-saving potential of the OWUN practice. Similar initiatives may be replicated in other healthcare facilities.
Keywords: Order What You Need, Medication saved, Unwanted medicine, Cost savings, Pharmacy

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Introduction

In Malaysia, there was nearly RM2 millions disposal of expired medicines at government facilities from 2014 to 2016 (1). At Hospital Canselor Tunku Muhriz, approximately RM174,369 worth of expired medicines were returned by patients annually from home between 2015 and 2017 (2). Similarly, the Malaysia National Cancer Institute recorded RM133,473 worth of returned medicines from home within four months period from January to April 2019 (3). The common reasons for returning medicines at the pharmacy included stockpiling at home, change of medication or discontinuation, allergies or side effects, non- compliance and death of patients (2,3). Medications returned from households cannot be reused and must be disposed of appropriately. The disposal of medicines has not only caused economy loss due to wasted medications and associated disposal costs, but also environmental threats if these medicines were not disposed properly (4,5). Improper disposal of medicines may lead to polluted water as mentioned in the Research by the World Economic Forum, for example, improper disposal of antibiotic may leak into water system and contribute to antibiotic resistance (5), which may then result in ineffective treatment, increased difficulty to treat patient, and even mortality (6).

A report by the Department of Health, United Kingdom estimated that unused medicines cost the National Health Service (NHS) around £300 million annually (7). The "Order What You Need” and “Not Dispensed” programme was carried out in the United Kingdom since 2012 to reduce medication wastage. Under these programmes, pharmacists were encouraged not to dispense medicines to patients or caregivers who informed that they no longer require the medicines, and patients or carers were advised not to refill prescriptions unnecessarily if they still have adequate supplies at home (7,8). A similar OWUN

project was implemented as Quality Improvement Initiative project by Mazlan et al. at the Malaysia National Cancer Institute to reduce the return of analgesics from patients' homes (3). The project also included awareness campaign to inform patients about the importance of checking their balance of medicines before refills, and create awareness that the returned medicines cannot be reused and must be disposed by the pharmacy. By implementing these strategies, the project resulted in a 21% reduction in the cost of returned medicines and a saving of RM5,944 (4).

Since July 2022, the pharmacy outpatient department at the Labuan UTC Heath Clinic has implemented the OWUN initiative. All patients or caregivers who presented a prescription for medication refill will be interviewed by the pharmacist about existing medicine supplies at home before dispensing the refills. All unwanted medicines by patients or caregivers during the prescription screening and dispensing process were recorded to serve as evidence for internal audits (9). By assessing the remaining supplies, pharmacists can evaluate patients' medication adherence and determine the appropriate quantities to be dispensed after discussing with the patients or caregivers. This study was conducted to estimate the potential cost saving of OWUN practice at the outpatient pharmacy of Labuan UTC Health Clinic.

Method

This retrospective study utilised secondary data extracted from the record of OWUN unwanted medicines from April to September 2023. This study employed universal sampling, including all records of unwanted medicines during the study period. Medicines returned from home were excluded from this study.

Unwanted medicines referred to medicines that are voluntarily declined by patients or caregivers during the screening or dispensing process at the pharmacy outpatient counter. The amount of dispensed medicines was adjusted to ensure sufficient medication until the next scheduled prescription refill date, based on patients or caregivers' agreement. These medications were classified according to the classification index based on pharmacological groups in the British National Formulary (11).

The cost savings of medications was the cost of unwanted medicines not dispensed to patients or caregivers, which was calculated based on the latest unit cost price obtained from the Pharmacy Information System (PhIS). To standardise the calculations, medication quantity was calculated as the number of units of inhalers, tablets, capsules, bottles, or insulin pens (11).

Microsoft Excel was used to collect information, analyse data and generate descriptive result. Descriptive statistics including frequency and percentage and mean with standard deviation (SD) were used in this study. This study was registered in the National Medical Research Register (NMRR ID-23-03636-SXU) and ethical approval was obtained from the Medical Research and Ethics Committee (MREC), Ministry of Health Malaysia.

Results

During the study period, 235 patients utilised the OWUN initiative. More than half of these patients (62.5%, n=147) were 60 years old and above, and 136 (58%) were female.

Table 1: Demographic characteristics of study population (n=235)

Variable	n (%) / Mean (SD)
Age, year, mean (SD)	60.1 (12.8)
Age range (year), n (%)	
18-29	6 (2.6%)
30-39	6 (2.6%)
40-49	25 (10.6%)
50-59	51 (21.7%)
≥60	147 (62.5%)
Gender, n (%)	
Male	99 (42.1%)
Female	136 (57.9%)
Origin of prescription, n (%)	
Hospital Labuan	35 (14.9%)
Labuan Health Clinic	73 (31.1%)
Labuan UTC Health Clinic	127 (54.0%)

Abbreviation: SD = Standard deviation; UTC = Urban Transformation Centre

As shown in Table 1, half of the refilled prescriptions were from Labuan UTC Health Clinic (n= 127, 54%), followed by prescriptions issued from Labuan Health Clinic (n=73, 31%) and Hospital Labuan (n=35, 15%). A total of 46 types of medicines were reported as unwanted by patients or caregivers. The total quantity of unwanted medications was 9,572 units, amounting to a total cost of RM2,634.

Table 2: The quantity and cost of unwanted medications at outpatient pharmacy by pharmacological groups

Pharmacological Group	Medication quantity (unit)	Cost, RM (%)
Respiratory system	90	1,080 (41.0)
Endocrine system	4,343	714 (27.1)
Cardiovascular system	3,201	465 (17.7)
Nutrition	1,322	199 (7.6)
Gastro-intestinal System	310	77 (2.9)
Other	306	99 (3.8)
Total	9,572	2,634

Abbreviation: RM = Malaysia Ringgit

As shown in Table 2, respiratory group medications had the highest proportion of cost (41%), followed by endocrine group (27.1%) and cardiovascular group (17.6%). Among these, antidiabetic drugs (metformin and gliclazide) and antihyperlipidemia drugs (atorvastatin and simvastatin) were the most frequently reported unwanted medications (Figure 1).

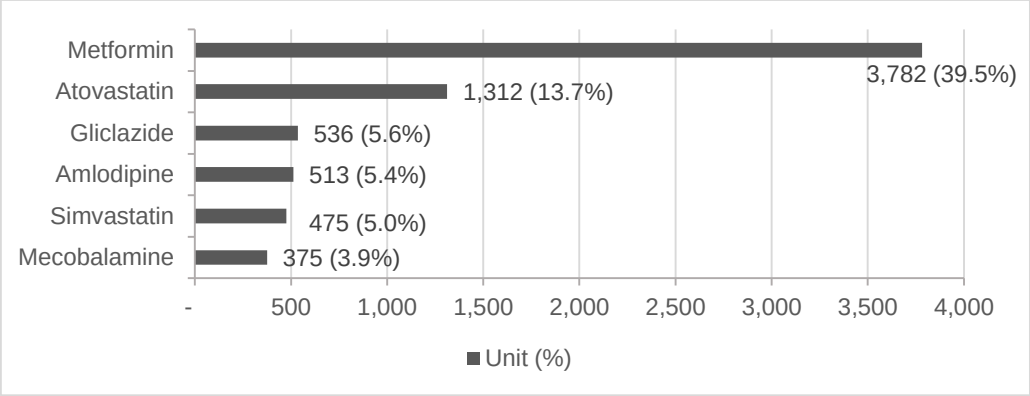

Figure 1: Top six types of unwanted medicines by quantity (unit)

Discussion

This study was conducted to estimate the potential cost saving of OWUN practice at the outpatient pharmacy of Labuan UTC Health Clinic. Among the refilled prescriptions, almost half of them were from Hospital Labuan and Labuan Health Clinic. Due to the strategic location of Labuan UTC Health Clinic, which is situated next to a morning market and located within a building that houses multiple government agencies, it is considered a convenient choice for patients to refill their medicines.

In this study, an average of 1,595 units of unwanted medications were identified at the pharmacy outpatient counter each month, which was higher than the 921 units of home-returned medications per month in a previous study (11). However, the average monthly cost of unwanted medications in this study (RM439) were lower than the monthly cost of home-returned medications in the mentioned study (RM1,133) (11). This difference in costs may due to the nature of the prescriptions at Labuan UTC Health Clinic, which mainly consists of non-specialist medications that were generally less expensive than specialist medications. Bekkers et al. found that approximately 39% of returned medications were classified as preventable waste, as they were unopened, undamaged, and had at least six months remaining before expiry (12).

This study identified that metformin and gliclazide were the most frequently unwanted antidiabetic medicines. This could be attributed to non-compliance or side effects. Complex dosing regimens requiring multiple doses per day, which can sometimes cause patient to forget to take their medicines (3,11). On the

other hand, antihyperlipidemic drugs such as atorvastatin and simvastatin, were the second most common unwanted medicines. Possible reasons included patients' concern about the side effects like muscle pain and stiffness, as well as reluctant to take (11). In addition, some patients may mistakenly believe that atorvastatin must be taken at night like simvastatin, which was a leading cause of poor adherence as certain patients tended to forget to take the medicines at night. In such cases, pharmacists may play a role by discussing with prescribers to simplify the regimen, such as to prescribe atorvastatin with instruction for once daily dosing at any convenient time to improve compliance (11).

This study found that the highest cost of unwanted medicines originated from the respiratory group, accounting for nearly half of the total cost, followed by the endocrine and cardiovascular groups. Notably, despite having the lowest quantity of returned units, respiratory medications imposed the greatest financial burden due to the high unit prices of inhalers such as salbutamol and budesonide metered dose inhalers (MDI). In another study by Jamaluddin et al. (2022), the authors reported substantial wastage in the endocrine and cardiovascular categories, particularly due to the high cost of insulin (11).

A major potential contributor to respiratory medication wastage was the inability to visually assess the remaining doses in inhalers (13). As a result, patients or caregivers may refill prescriptions unnecessarily, leading to medication stockpiling. To address this, it is essential for patients to bring their inhalers to the pharmacy during refills. Pharmacy staff can estimate remaining doses based on dispensing records and typical usage patterns, while also educate patients on proper tracking methods. Labelling the date of opening and explaining the total dose capacity, such as the 200-dose content in a typical salbutamol inhaler, can help patients avoiding unnecessary refills (15). The availability of fully subsidised medications under the Malaysian public healthcare system may inadvertently lower patients' motivation to monitor their existing medication supplies. Educating patients about the value of medications, such as displaying cost prices on medication packaging, is a promising step taken by the Ministry of Health to foster appreciation and responsible use (2). Pharmacy staffs also need to educate patients or carers that medication returned from home cannot be reused by pharmacy, therefore, they must avoid wastage cause by stockpiling medication at home. To further reduce medication wastage, pharmacists should emphasise the importance of adherence and encourage patients and caregivers to bring their remaining medications when refilling prescription.

A limitation of this study was the potential for recall bias, as some patients or caregivers may not have accurately remembered or checked their remaining medicine supply before refilling. In some cases, patients were unaware of the need to verify their stock. Introducing a simple take-home form for recording the quantity of remaining medicines could support more accurate dispensing and minimise recall bias. This strategy would not only improve inventory management but also saving time during pharmacy visits (2). Implementing structured documentation of home medicine inventories can enhance future studies and strengthen interventions aimed at minimising unnecessary medication supply.

Conclusion

The findings demonstrate potential cost savings of medications through the implementation of OWUN, with the highest savings observed in respiratory, endocrine, and cardiovascular group of medications. Similar initiatives can be replicated in other healthcare settings. Active participation from patients and caregivers was essential in reducing medication waste and supporting environmental sustainability.

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Conflict of Interest

No funding was received for this study. The authors have no conflict of interest to disclose.

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