RESEARCH ARTICLE

A STUDY TO IDENTIFY THE ISSUES AND BARRIERS EXPERIENCED WHEN CHANGES TO A PATIENT MEDICATION REGIMEN ARE RECOMMENDED BY PHARMACISTS IN THE COMMUNITY SETTING IN AUSTRALIA

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ABSTRACT

Background: In Australia, 10-16% acute hospital admissions is related to medication. Home medication review is offered to patients using multiple medications, those with narrow therapeutic-index. It is also recommended for people with recent changes to their medication, who were recently discharged from hospital or who have difficulties with their medication.
Objectives: The aim of this study was to identify issues that arise during the process and explore the barriers experienced when changes to patient medication regimen are recommended.
Setting: All interviews were conducted in Australia in patients' homes in accordance with the appropriate guidelines.
Method: This study used historical data from past consultations conducted in Australia.
The audit was approved by the University of Wolverhampton Human Research Ethics Committee. It is based on anonymised historical data.
Main outcome measure: This audit explored improvement in patient health outcomes and service satisfaction
Results: Out of 28 home medication reviews, only two occasions were the pharmacist's recommendations, actioned. On eight occasions, the clinic receptionist acknowledged the receipt of the report but it was not actioned and on 18 occasions no response was received from the doctor or the clinic receptionist.
Conclusion: This audit suggests four important areas in the home medication review process require review; the initiation of home medication review, the requirement for diagnostics and recent history to be provided prior to the review, the need to for discussion between the doctors and pharmacists around the recommendations and whether they will be actioned or the reason if they will not be actioned.

INTRODUCTION

Medication-related hospitalizations are frequent, estimated to account for about 10 - 16% of all admissionsto medical departments, with most of them judged to be preventable (Kongkaew, 2008; Mathews *et al*., 1988). Also; patient adherence to their medication regimen has been shown to be lower than 50% (Mathews, 1988). This suboptimal use of medication reduces the patients' quality of life and is costly for society.

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Globally, pharmacist-ledmedication management review is a widely-recognised concept to help address this; however, the way it is conducted varies between countries. Many countries perform this function from within ahospital or community pharmacy, whereas in Australia home medication review (HMR) accredited pharmacists can outreach to the patients in their home or in residential accommodation. This should place Australia at an advantage in gaining benefits. The Australian Government initiated the HMR program, managed by the Pharmacy Guild of Australia and funded by Medicare. For a pharmacist to conduct HMRs, they must successfully complete one of the approved credentialing programs provided by the Australian Association of Consultant Pharmacists, or the Society of Hospital Pharmacists of Australia.

The HMR process involves the patient, their local general medical practice and pharmacists. Where the local pharmacist is not accredited, an accredited pharmacist can be chosen by the patient or their local community pharmacy to undertake the review. HMR is an outreach health service delivered at the patient's domicile. The doctorrefers the patient to a pharmacist; who conducts an interview, usuallywhere the patient lives, unless there is any safety or access concerns (which happens occasionally). The pharmacist performs the HMR and identifies medication-related problems/issues to be resolved. A report is written from the pharmacist to the doctor suggesting actions which, based upon the information available, the pharmacist believesare appropriate. In theory, the doctor completes the process by informing Medicare of the receipt of the pharmacist's report and reviewing and actioning appropriate suggestions. HMR is a formal process, where both the doctor and pharmacist are remunerated from public funds.

HMR is recommended for any patients taking five or more medications, have recently spent time in hospital, are concerned or confused about their medications or are non-adherent to their medication regimen (Morrissey *et al*., 2015). While the process is intended to be a complete cycle, commencing from the doctor's clinic and completed there, it is disjointed by problems arising infour areas:

- Point of referral to initiate the HMR process. On many occasions patients or pharmacists formally request the referral letter from the doctor, to addressa patient's expressed need, or as identified by the pharmacist.In practice, it may often take several weeks even to several months before a referral letter is raised, if it is raised at all (Morrissey *et al*., 2015; Rigby, 2010; Rigby, 2011; Harris *et al*., 2011; Tordoff *et al*., 2012; Morrissey, 2015; Gerard *et al*., 2012). The referral. The referral is frequently received by the pharmacist with only minimal supporting clinical information, leading to additional time being lost while the pharmacist requests additional information from the doctor's clinic. Further the system places no obligation on the doctor to provide this and it may not be supplied. Yet, it is practically impossible for a pharmacist to make meaningful comments on the prescribed regimen without this information.
- The completed report. When an electronic copy and the written report arereturned to the doctor's clinic, it may be several weeks before acknowledgement is received. Reports (and personal experience) show that this frequently occurs only when the pharmacist callsthe practice to request it,and then receives only a verbal confirmation that the report was received.
- Post-submission of the report to the general medical practitioner (GP), the recommendations should be actioned. It would be a common courtesy and help in future reporting if any reasons for not actioning the recommendations were provided to the patient and/or the pharmacist but currently there is no obligation on the GP to do this.

The author had a conversation where a GP reported that an HMR received was 'useless' because the pharmacist had completely ignored that the patient had 'xx disease'; the doctor was asked whether that information had ever been relayed to the pharmacist or how the pharmacist would have had any other way of knowing this? Clearly there are communication issues to address.

This audit aimedto analyse some of the findings from pharmacists' reviews and the recommendations made, to examine the limitations in the current process.

Aim

The aim of this study was to identify issues that arise during the process and explore the barriers experienced when changes to patient medication regimen are recommended.

Ethics approval

The audit was approved by the University of Wolverhampton Human Research Ethics Committee. It is based on anonymised historical data. Home medication review interviews were conducted in accordance with the appropriate guidelines.

METHODS

The study was conducted on pooled, anonymised historical data from HMR reviews undertaken by the first author, who is anHMR accredited consultant pharmacist, with a PhDthat studied pharmacist involvement in chronic disease management in primary care.The sample consists of all patients referred to the author during a consecutive recent 12-month period (dates not stated to maintain patient and doctor identities confidential). Ethics clearance to use the historical data was obtained from the University of Wolverhampton Ethics in Human Research Committee (LSEC/2016/17/HM/103). The interviews had been conducted on referral from the patient's doctor and patients were aware in advance of the pharmacist's visit. The interviews were conducted in accordance with the home medication review guidelines of the Australian Association of Consultant Pharmacists and the Pharmaceutical Society of Australia (Morrissey *et al*., 2015).

This study reviewed in detail the reports and recommendations from 28 historical HMR's, and all outcome information received from the patient, the patient's residence and the medical practice.

RESULTS

All data included was frompatients who had multiple comorbidities of chronic diseases. Of the 28 patients 32% were men (n=9) and 68% women (n=19). The largest group of the men (n=4) were in the 50 to 59 yearsage group and majority of women (n=7) were aged between 70-79 years old (Figure 1).
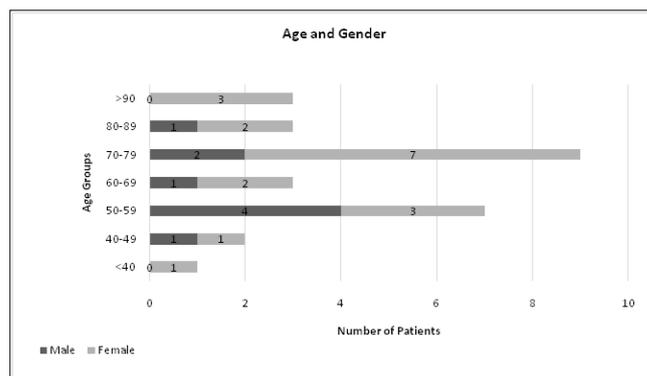

**Figure 1. Population age and gender**

Living conditions were considered to establish if the patient self-managed their medication or had a carer (Table 1).

Table 1. Social status of living

| Social status	Number of patients	
Living with*	Male	Female
A	0	5
FC	0	1
FC	0	1
FC	0	1
FC	1	0
FC	0	6
FC	0	1
FC	0	1
FC	2	1
FC	5	0
FC	2	0

* Living with family/carer (FC) or lives alone (A).

The group included nine current smokers andeight ex-smokers. Five patients reported using Kava (*Piper methysticum*) on a regular basis whilenine reported consuming more than two standard alcoholicdrinks a day (Figure 2). In 2003, the Food and Drug Administration issues a warning as a result of 11 cases of hepatic failure leading to liver transplants and four deaths. Kava toxicity appears to be "idiosyncratic" (Rigby, 2010).
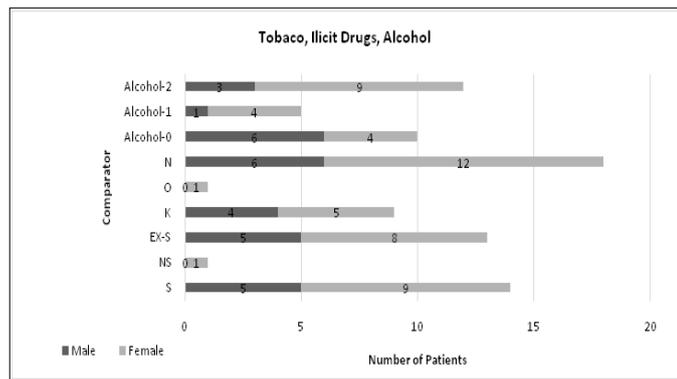
*Alcohol: nil (0), one drink (1), two drinks (2)
**Recreational drugs: Kava (K), Others (O), Never-used illicit drugs(N)
***Tobacco Smoking: Smoker (S), Never-smoked (NS), EX-smoker (EX-S)

Figure 2. Tobacco smoking, illicit drug use and alcohol daily intake

One personwas in a wheel-chair (female), six were physically active (four females and two males) and 21 physically inactive (13 females and eight males). The most frequently used medications are shown in figure 3. All used medications are listed in appendix 1.
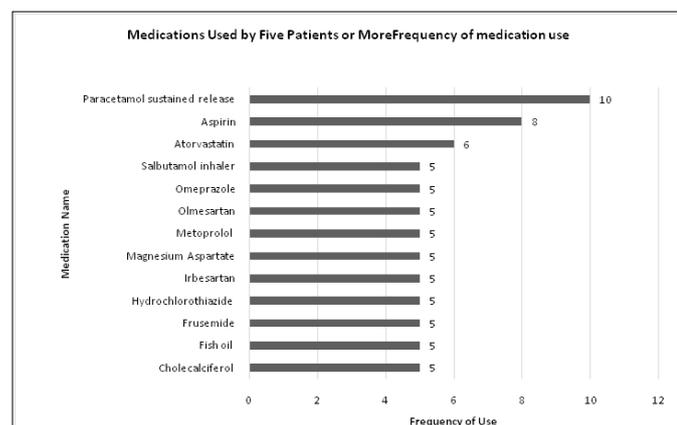
Figure 3. Medications used by five patients or more

The 28 patients had diagnoses for 37 different chronic conditions with an average of four per patient. Hypertension was the most common condition seen in 19 patients with comorbidity of other cardiovascular diseases such as heart failure in 11 patients. Both diabetes mellitus type 2 and gastroesophageal reflux disease (GORD) were seen in 10 patients. Figure 4 illustrates the conditions seen in the sample population by frequency, in five patients or more, where table 2 shows those with frequency less than five:
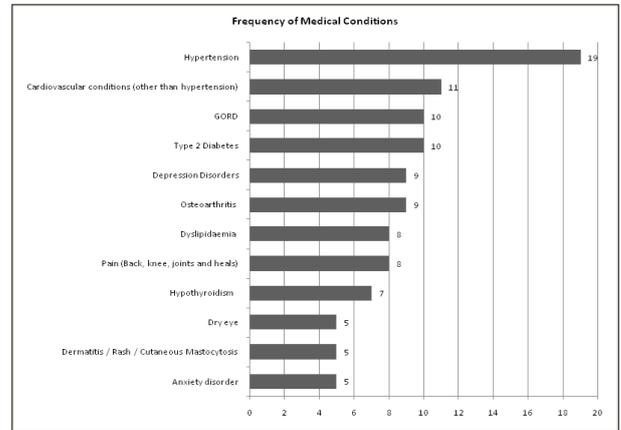

Figure 4. Conditions seen in the sample population by frequency

Table 2. Conditions seen in less than five patients

Medical conditions	Frequency
Alpha thalassaemia trait, Dandruff, Diabetic nephropathy, Hashimoto, Iron deficiency, Menopause, Nausea and vomiting, Peripheral neuropathy, Psoriatic arthritis, Restless leg syndrome, Stool incontinence, Ulcerative colitis	1
Alzheimer's, COPD, Glaucoma, Gout, Prostate carcinoma, Recurrent UTI, Sinus, Urinary tract infection	2
Asthma, Dry mouth / Dysphagia, Inflammatory Bowel Disease	3
Diabetic retinopathy, Urinary incontinence, Osteoporosis	4

HMR communication between doctors and pharmacists

Examining the communication processes and the timeframe between referral, review undertaken, submissionof the report and the doctors'feedbackidentified major lapses of communication. For 68% of reports submitted, no acknowledgement was received. On 93% of reports no feedback received from the doctor and only 18% of reports received an acknowledgement of receipt from the clinic receptionist (Figure 5).
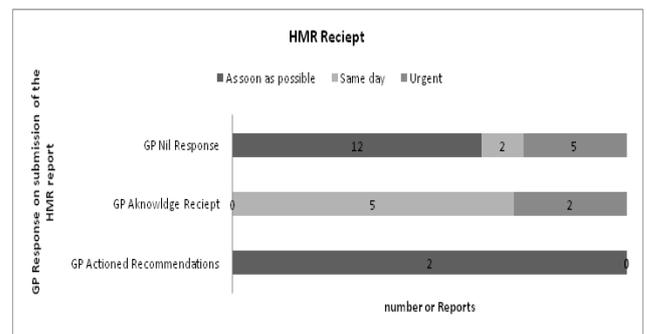
Figure 5. Communication between pharmacists and doctors during the HMR process

The pharmacists' reports were all submitted within 48 hours from the receipt of the referral (Figure 6).
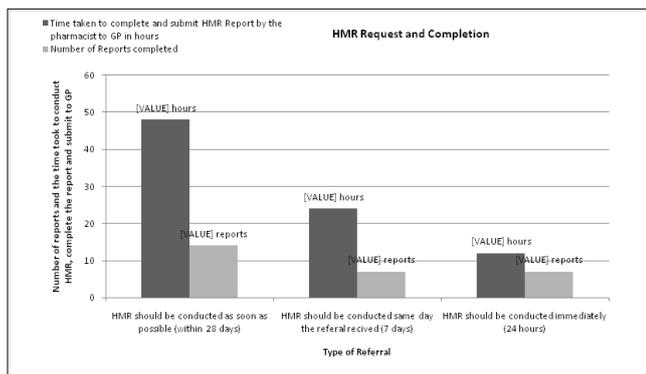
Figure 6. Time indicated on the HMR referral

Appendix2 contains the full details of patients' reasonsfor requesting HMR from their doctor compared to the pharmacist's observations during the visit, together withthe doctors provided reasons for referring the patient for HMR.On only 11out of 28 occasions did the three aspects match. Regarding the reason for referral (Figure 7), there was average of four reasons given for referral per person. The most selected reason was number of medications and least reason selected was smoking cessation.
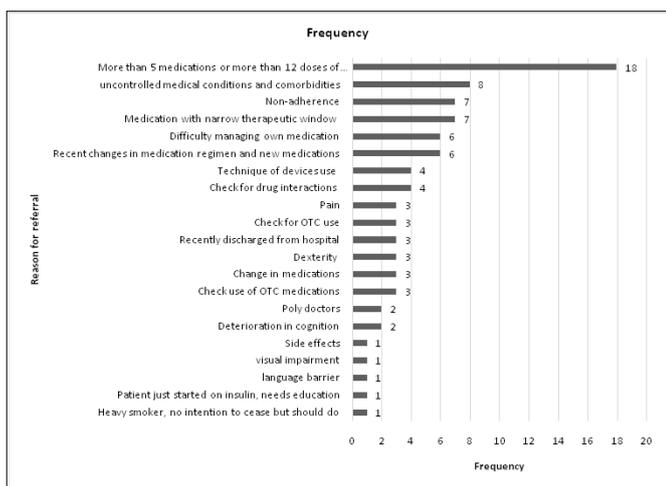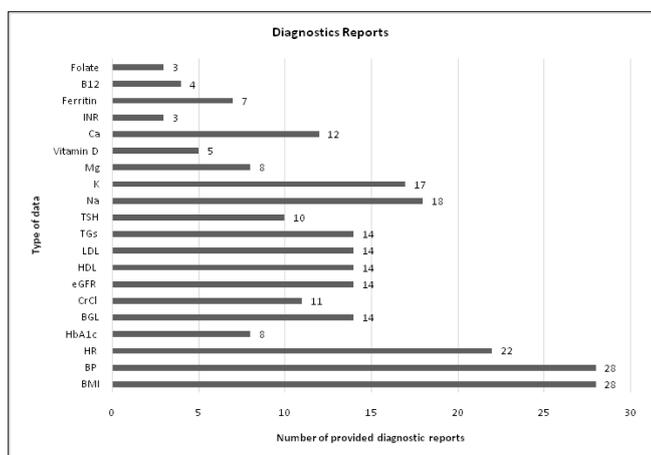

Figure 7. Reasons for referral

*BMI- body mass index, BP-blood pressure, HR-heart rate, HbA1c- glycated haemoglobin, BGL-blood glucose level, CrCl- creatinine clearance, eGFR-estimated Glomerular Filtration Rate, HDL- high density lipoprotein, LDL- low density lipoprotein, TGs- triglycerides, TSH- thyroid-stimulating hormone, Na-sodium, K- potassium, Mg- magnesium, Ca- calcium, INR- international normalized ratio, B12- vitamin B12.

Figure 8. Diagnostics received by the pharmacist on point of referral or on request

In 50% of cases, the pharmacist received no diagnostic information or investigation results until they were requested. However, once requested, sufficient information was supplied to make recommendations at the time of the interview. Creatinine clearance was calculated whenever possible and was used for six occasions where the estimated glomerular filtration rate (eGFR) value was not provided by the doctor. Figure 8 summarises the number of recommendations that were made. Most of them applied to a number of patients.
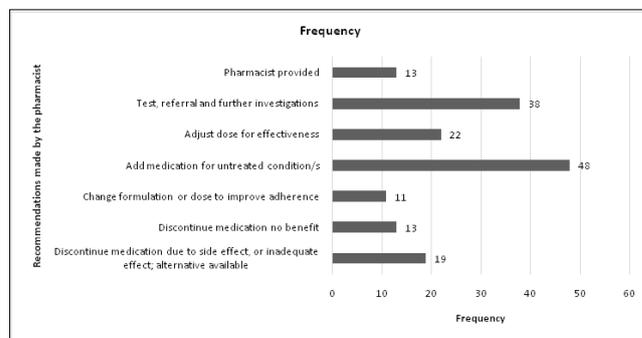

Figure 9. Recommendations categories made by the pharmacist and included in the HMR report to the doctors

The most critical recommendation madewasrequesting aninvestigation to eliminate lung cancer. Hearing nothing from the practice, after 4 weeks, the patient called an ambulance andat the hospital, was diagnosedwith advanced lung cancer. No responsehad been received from the doctors regarding the HMR report and the practice had taken no action. The second serious referral, which both the pharmacist and the carer independently attempted to follow upwith the practice, was a patient who seemed to have sepsis and worsening cardiacand renal failure. Both the carer and the pharmacist made clear to the doctor that the patient had seriously deteriorated since last seen, but no response was received from the practice, and again the family took the patient to hospital, where they were admitted.

DISCUSSION

Whilst this sample was small (n=28), the issues identified are in line with those reported in other studies; the communication breakdown was also similar to that identified in number of studies (Rigby, 2011; Harris *et al*., 2011; Tordoff *et al*., 2012; Morrissey *et al*., 2015; Gerard *et al*., 2012). The current Australian concept of HMR appears sound, but in reality, the process and responsibilities could benefit fromrevision. All HMR accredited pharmacists are trained to the same level; completion of one of the national accreditation courses. Thesearelargely theoretical, based on coursework andthe experience level at entry may vary. A minimumof two years practiceexperience is required but some entrantshave moreand may also have postgraduate qualifications. The assessment is also of a traditional style, heavily dependent upon demonstrating written knowledge, both in case-based and online multi-choice question assessments. There appears to be a mismatch between the training and the real-life HMR process, where reference to primary evidence sourcesand guidelines are used to justify recommendations. It is postulated that the missing element in both the training and assessment are:

- Oral communication skills; the ability to communicate clinical knowledge with doctors and patients.

- The ability to use devices and demonstrate their use to patients.

In a study to evaluate pharmacists' perceptions of service benefits to older people in New Zealand, participants found that patients benefit more when medication management reviews were combined with other services such as international normalised ratio monitoring, point of care testing and education. Another study of HMR in chronic disease management, indicated that fromall participatingpharmacists' requests to GP's to initiate a referral for HMR, only 30% were actioned and received (Gerrard *et al.*, 2012)). In this study, only two GP'stook the time to write back to the pharmacist providing feedback on their patients. Both thanked the pharmacist for their constructive suggestions and reported them to have been implemented. This demonstrates the value of two-way communication and underlines the limited value of HMR when the communication is only uni-directional. Stone and Williams (2015) discuss the importance of the development of pharmacists working in general practice in the United Kingdom. They discuss the changing emphasis in primary healthcare with the challenge of non-communicable diseases. Once the diagnosis is made, the challenge is maintaining adherence to therapy. To achieve this, new approaches will be required and pharmacists working side by side with doctors with open communication is seen as integral to the model. Gerrard *et al.* (2012) looked at patient preferences in seeing health professionals at their GPpractice. They found patients preferred to see their own GP but would rather see a pharmacist than an unfamiliar doctor. Primary healthcare must change from an acute sickness service to a chronic disease adherence support model, focussed on achieving the best possible results from ongoing medications. This works better in a team approach with effective communication between team members. As shown in this study, there were examples of excellent practice and good communication but there also were many missed opportunities. In the busy, time pressured, world of general medical practice, a high level of tasks prioritisation is essential. However, it is clear from this study that the potential outcomes of this publicly-funded intervention are currently compromised. The reasons are multifactorial, and may include, but are not limited to the following:

- Pharmacists may send the doctor long reports rather than a concise report with clear justifiable recommendations.
- They use terminology that may be perceived as offensive; such as 'inappropriate prescribing.' We do not believe any doctor will intentionally to prescribe inappropriately.

Doctors may feel that

- They already invested the time and effort to generate the referral and that no additional time should be used for the same patient without a furthervisit charge.
- The issues they referred the patient to the pharmacist for, can be resolved by the interview alone without follow-up actions required of them.
- The pharmacist's recommendations were not considered sound or based on the full picture of the patient history and comorbidities.
- The reports are filed in the patient record by clinic manager without GP review.

These issues are unlikely to be corrected without revision of the current HMR process. It requires afinal step offormal correspondence from the GP to the pharmacist acknowledging receipt of the report, and their intended action to close the care cycle. The correspondence should include explanation of the reason for dismissing any of the harmacist'srecommendations. This should occur before paymentto the pharmacist and GPare authorised. It is understood that some of the recommendations cannot be actioned, and some will be a matter of opinion, however, for patients' benefit, and the pharmacist's education, clarification is essential. Patients need to know that the time spent with thepharmacist at their home was valued and that the two parties involved in their carecommunicated on those issues together. The process should focus on patients' outcomes, not the income generation process.

Under the present system, the pharmacist receives no remuneration until the doctor reports to Medicare that the pharmacist's report has been received, but the doctor is remunerated immediately the referral is sent. A requirement of follow-up communication before any remuneration could provide a means of closing that loop. A balanced requirement that was simple and quick for example, using two on online tick boxes for the doctor to acknowledgement 1) receipt of the pharmacist report and 2) their intention (to action or not action the recommendations). Similar online questions should be directed to the pharmacist after the GP complete their section to indicate the required two-ways communication has been completed.

Conclusion

This study appears to demonstrate a disconnection in communication that adversely affects the continuity of care, interdisciplinary input into care andmay compromise patients'health outcome. It appears there are four areasthat are not yet addressed and require further consideration.

These are;

- The initiation of HMR process: consideration needs to be given to enabling pharmacist-initiated HMR, while maintaining GPinitiation as an equally important route.
- Provision of required history and diagnostic information prior to the review. This must be an expectation on referral by the GPor request by the pharmacist for the purpose of a review.It is unrealistic to expect a pharmacist to make appropriate recommendations without this information.
- Acknowledgement of receipt of the report by the GP should also be a firm obligation. Feedback on the actions to be taken should be submitted to Medicare with the claim for payment, copied to the pharmacist.
- Discussion and/or action of recommendations. This should be an expectation and actively encouraged.
- HMR is a potentially valuable service but some fine-tuning of the process is required, if it is to deliver value for money and positive outcomes.

Conflicts of Interest

REFERENCES

Kongkaew C, Noyce PR, Ashcroft DM. 2008. Hospital admissions associated with adverse drug reactions: a systematic review of prospective observational studies. *Ann Pharmacother.*, 42:1017-25.

Beijer HJ, de Blaey CJ. Hospitalisations caused by adverse drug reactions (ADR): a meta-analysis of observational studies. *Pharm World Sci* 2002;24:46-54.

DiMatteo MR. Patient adherence to pharmacotherapy: the importance of effective communication. *Formulary* 1995;30: 596-8, 601-2, 605.

Home Medication Review - 6th Australian Pharmacy Guild – Government Agreement. Available from: http://6cpa.com.au/medication-management-programmes/home-medicines-review/. Cited 2016-11-15.

Mathews JD, Riley MD, Fejo L, Munoz E, Milns NR, Gardner ID, *et al*., Effects of the heavy usage of kava on physical health: summary of a pilot survey in an Aboriginal community. *Med J Australia* 1988;148(11):548-555.

Morrissey H, Ball PA, Jackson DM, Pilotto LSJ, Nielsen S. Viability and sustainability of pharmacist input in chronic disease management in rural Australia. *JPPR* 2015;45(3):262-272.

Morrissey H, Ball PA, Jackson DM, Pilotto LSJ. Community Pharmacists' Intervention: How a 6-episode of one-on-one intervention changed patient's attitudes towards their medication and disease self-management. *Int J Pharm* 2014;4(4):5-13.

Rigby, D. Collaboration between doctors and pharmacists in the community. *Australian Prescriber*. 2010;33(6):191-193.

Morrissey H, Ball PA, Jackson DM, Pilotto LSJ, Use of chronic disease management algorithms in Australian community pharmacies. *Res Soc Admin Pharm*, 2015;11(2):176-196.

Rigby, D. Pharmacists' culture –the ultimate barrier? *Australian Pharmacist*2011;30(10):827.

Harris MF, Jayasinghe UW, Taggart JR, Christl B, Proudfoot JG, Crookes PA, *et al*. Multidisciplinary Team Care Arrangements in the management of patients with chronic disease in Australian general practice. *Med J Australia*. 2011;194(5):236-239.

Tordoff J, Chang SY, Norris PT. Community pharmacists' perceptions of services that benefit older people in New Zealand. *Int J Clin Pharm* 2012;34(2):342-350.

Morrissey H, Ball PA. Competition fears are hindering care of Australians with Chronic Disease. *Int Pharmacy J* 2015;33(1):26-28.

Stone MC, Williams HC. Debate & Analysis. Clinical pharmacists in general practice: value for patients and the practice of a new role. *Brit J Gen Pract*. 2015;May:262-263

Gerard K, Tinelli M, Latter S, Blenkinsopp A, Smith A. Valuing the Extended Role of Prescribing Pharmacist in General Practice: Results from a Discreet Choice Experiment. *Value in Health* 2012;15:699-707