
MOTIVATE

MEDICATION-OVERUSE HEADACHE: EDUCATION IN DIAGNOSIS, PREVENTION,
MANAGEMENT AND PATIENT EDUCATION

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FINAL REPORT

ABSTRACT

Purpose: The purpose of the continuing professional development program (CPD) was to reduce the gaps in knowledge, attitudes and systems in the prevention, diagnosis and management of MOH in the Australian primary care setting.

Methods: We developed and delivered a Category 1 Quality Improvement & Continuing Professional Development (QI&CPD) 6-hour Active Learning Module (ALM) called MOTIVATE or MOH: educaTion in dlagnosis, preVention, mAnagement and paTient Education to achieve demonstrable changes in primary care practice, in the general practitioners' (GPs') and pharmacists' knowledge, skills, behavior and attitude, while considering patient safety.

Results: Of those who completed the entire program, 80% said that the learning objectives were fully met, 88% rated MOTIVATE as entirely relevant to their practice; 83% said that their learning needs were met. Participants reported increased awareness and knowledge of MOH after the program, and increased knowledge with regards to MOH diagnostic criteria. Compared with 50% of GPs who reported not so or not at all confident with their knowledge of withdrawal symptoms, 80% of the participants correctly identified all four withdrawal symptoms of MOH.

Conclusions: The MOTIVATE program effectively narrowed the gaps in knowledge, attitudes and systems in the prevention, diagnosis and management of MOH in Australian primary care.

Key words: Secondary headache disorders; primary health care; continuing medical education; continuing pharmacy education; interdisciplinary CME; educational measurement; mixed-methods

PURPOSE OF THE ACTIVITY

The purpose of the activity was to reduce the gaps in knowledge, attitudes and systems in the prevention, diagnosis and management of MOH in the Australian primary care setting.

SCOPE

BACKGROUND

The World Health Organization reports that 50% of people with headache are primarily self-treating, without consulting a health professional. Educating patients effectively and efficiently, especially on the avoidance of MOH, is viewed as a public health concern. Neurologists on the other hand consider the lack of education of health professionals involved in the care of people with headaches to be the key issue that impedes better management of headache.¹

The Bettering the Evaluation and Care for Health (BEACH) program of the Family Medicine Research Centre (FMRC) of the University of Sydney and the Australian Institute of Health and

Welfare (AIHW) administer reports that in more than 600,000 patient encounters between April 1998 and March 2004, patients with headache presented at a rate of 1.9 per 100 encounters, with undefined headache as the most common at 18.7%, followed by migraine at 14.0%. The medication rate for undefined headaches was 66.4 medications per 100 problems. Patients were referred elsewhere for undefined headache at a rate of 11.4 per 100 contacts. Primary care patients were mostly referred to neurologists (2.8 per 100 referrals).²

Migraine is frequently recognised in the Australian primary care setting, with about 12.3% of patients reporting three or more migraine episodes per month. Most Australians use over-the-counter (OTC) analgesics for mild to moderate migraine; but for severe migraine, patients turn to combined analgesics (e.g. paracetamol and codeine), many of which are available OTC. Prophylactic medication is underutilised, with only a small proportion (8.3%) of migraine sufferers taking prophylactic medication.³

Although under-diagnosis of migraine is less common in Australia compared with other countries, and Australian general practitioners (GPs) appear to follow recommended guidelines in the use of acute medications, there is still a risk of MOH as GPs seem to have limited knowledge and familiarity with the range of prophylactic therapies available for headaches that are well supported by published data and guidelines. Combined analgesics containing codeine are still being overused by their patients and GPs appear to limit their selections from a few acute agents (analgesics, triptans and ergotamines) as prophylaxis, despite the availability of prophylactic drugs for migraine in primary care.³

In a letter to the editor published in the *Australian Prescriber*, a pharmacist indicated that given the availability of OTC analgesics with codeine, the prevalence of MOH “in people who are unknowingly trapped in a vicious circle” is a cause for concern. Warning statements on many common OTC analgesics are scarce or absent. Consumer medication information materials have little information on the potential for developing MOH, the signs and symptoms to watch out for, and the importance of seeking medical attention should they become aware of this disorder.⁴

CONTEXT

The above findings from published literature identify the gaps in current practice that we think can be addressed by education and skills improvement through training of healthcare professionals and changes in practice systems (or procedural structures) to improve patient safety and awareness. However, the literature may not reflect current practice and is not specifically focused on MOH.

To confirm these gaps and have a better understanding of current clinical and educational needs, we conducted a needs analysis survey among headache patients, GPs and pharmacists.

Patients

Of the 63 patients surveyed, 35% have headaches everyday and 56% have headaches more than 2 times a week. Around 45% have had headaches for 20 years or longer, with the majority of them *always* (33%) or *often* (38%) buying OTC medications for their headaches and taking them *several times a week* (49%) or *daily* (22%). Most of them (47%) think that their intake of headache medication stays the same, while for 25%, intake varies. When asked whether their

GPs have ever offered them advice regarding the possibility that overuse of medication may cause headaches, almost half of them (49%) answered no. Around the same number of patients (50%) said that a pharmacist has never offered them that same advice. Eighty percent of them have never been diagnosed with MOH, and 84% said that they have never been advised to stop taking their medication nor have they been treated for MOH (86%). If told by their GPs to stop taking the medication that could be causing their headaches, 43% would decrease the number of times of taking the medication, 31% would stop taking the medication immediately and 29% would switch to another medication. Only 25% of the patients feel confident or very confident in their GP's ability to manage their headaches. Only 14% of the patients feel confident about the advice their pharmacists had given them about preventing headaches.

GPs

Headaches, migraine (95%) in particular, are a common diagnosis in general practice, and GPs are *fairly confident* (74%) in diagnosing headaches in general. While GPs have considered different types of MOH as diagnosis for patients presenting with headache in their practice, MOH due to fixed-combination analgesic (e.g. Panadeine Forte; 51%), opioid (45%) and single analgesics (34%) are the most common (Figure 1).

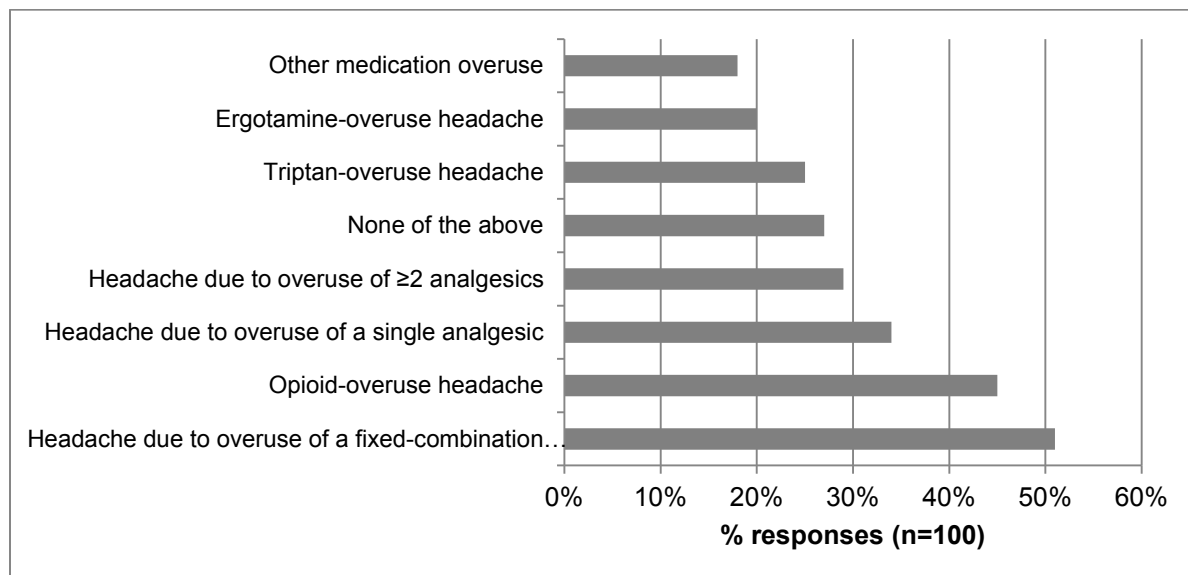


FIGURE 1. TYPES OF MEDICATION OVERUSE HEADACHES GENERAL PRACTITIONERS HAVE CONSIDERED AS A DIAGNOSIS FOR PATIENTS PRESENTING WITH HEADACHE IN THEIR PRACTICE.

When asked for the percentage of patients diagnosed with MOH that they managed themselves, the GPs were split between a low of 1–25% of patients and a high of >76% of patients. However, around 84% of the GPs said that only 0–25% of patients have been referred to a headache specialist or neurologist. The reasons given were the long wait (between 2 weeks to 6 months) for an appointment (81%), the need to travel more than 100 km (13%), and the expense for the patients (3%).

The most common reasons for specialist referral include patient's frequent relapses (72%), severe withdrawal symptoms (44%) and psychiatric comorbidities (38%). More than half of the GPs do not think that MOH is easy to treat once diagnosed or that patients are receptive to the

idea that their medication overuse may be the cause of their headache and would be willing to cease medication. Only 16% of GPs *always* educate their patients who may be at risk of MOH about prevention.

Around 86% of GPs are not aware of the International Headache Society guidelines on the prevention, diagnosis and management of MOH. If they need information about MOH, GPs turn to different sources such as the Royal Australian College of General Practitioners (RACGP), the Therapeutic Guidelines (<https://www.tg.org.au>), National Prescribing Services (<http://www.nps.org.au>), Medical Journal of Australia (<https://www.mja.com.au/>), Australian Doctors (<http://www.australiandoctor.com.au>), Uptodate (<http://www.uptodate.com>), MIMS (<http://www.mims.com.au>) or regular internet search (Google).

More than 70% of the GPs agree that further education about prevention, diagnosis and management of MOH would be beneficial for them, and that if such education is made available to them 63% would be willing to attend.

Pharmacists

When clients request a triptan for their headaches, more than half (54%) of pharmacists either *never* or *sometimes* offer verbal advice or information about MOH. Around 72% believe that there is not enough warning (e.g. consumer medication information leaflets) given to patients about the potential for developing MOH, and if these information are supplied to them 63% of them would *definitely* give them to customers who purchase pain relievers. More than 70% of the pharmacists indicated interest in attending an educational workshop about the prevention and management of MOH.

METHODS

PROGRAM DESIGN

We developed and delivered a Category 1 Quality Improvement & Continuing Professional Development (QI&CPD) 6-hour Active Learning Module (ALM) called MOTIVATE or MOH: educaTion in dIagnosis, preVention, mAnagement and paTient Education. The MOTIVATE program was accredited by the RACGP, the Australian College of Rural and Remote Medicine (ACRRM), and the Australian College of Pharmacists.

Being a structured quality education program, the aim of MOTIVATE was to achieve demonstrable changes in primary care practice, in GPs' and pharmacists' knowledge, skills, behavior and attitude, while considering patient safety. Developed by a multidisciplinary team of healthcare professionals with interest in headaches and education, MOTIVATE combines a variety of formats, such as online reading, quizzes, open discussions during the face-to-face meeting, case studies, videos, online forums, and practical application to ensure active and effective learning. The program consisted of:

- Predisposing activity/pre-work, requiring participants to recall a patient/client who presented with frequent headaches, or often seeks pain medication for headaches in their practice or pharmacy and how these patients were managed or whether they were referred
- Module 1: Fundamental concepts of MOH (a 2-hour online course)
- Module 2: MOH: a case-study approach (a 2-hour evening meeting or webinar)

- Module 3: Back at practice (a 2-hour combination of online and practical application of learning of how to obtain a comprehensive headache history)
- Reinforcing activity/post-work, requiring participants to ask patients who presented with frequent headaches, migraine or possibly MOH to complete a self-administered questionnaire, reflect on these responses then provide answers to questions about this reflection.

MOTIVATE was approved by the RACGP Quality Improvement & Continuing Professional Development (QI&CPD) program for 40 Category 1 points. The three modules were also accredited individually and GPs who opted to complete each of the modules without completing the predisposing and reinforcing activities could earn Category 2 or 2 points per hour or 4 points per module. MOTIVATE was also approved as a Planned Reflective Professional Development (PRPD) category activity by ACRRM for 30 PRPD. Pharmacists were provided with activity numbers for each of the components of the program and the meeting events for the self-reporting of their CPD activity.

Upon completion of the MOTIVATE program, the participants were expected to be able to:

- define MOH including the agents that are likely to cause this based on the ICHD-III diagnostic criteria;
- identify patients susceptible to MOH;
- develop integrated prevention and management skills, such that:
 - For pharmacists: when MOH is recognised, pharmacists are able to motivate patients to seek the help of GPs, and
 - For GPs: GPs are able to develop and negotiate an appropriate management plan and effectively communicate this to the patient; and
- put a system in place so that patients are made aware of their susceptibility or risk of MOH

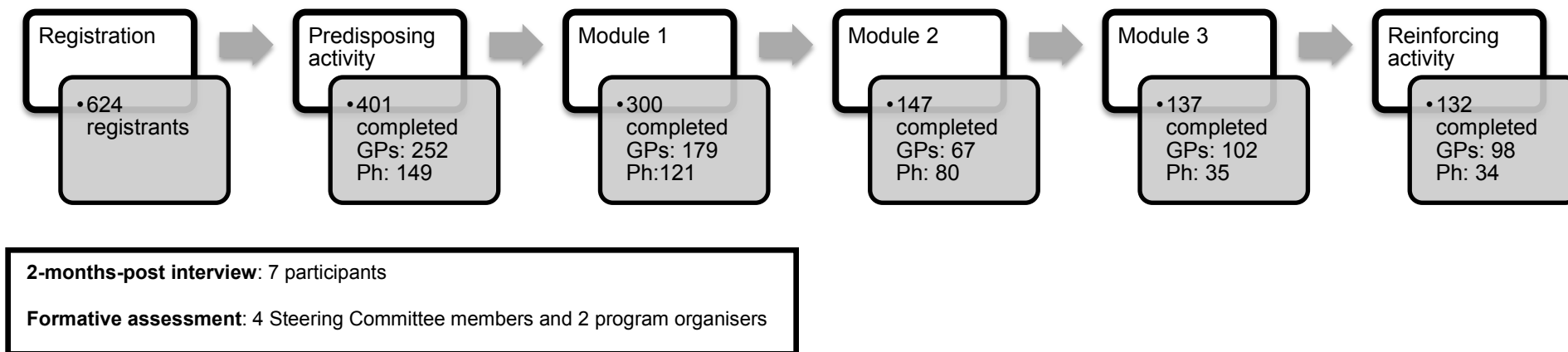
Integrated into the MOTIVATE program was a conceptual framework of assessing the effectiveness of the program in instilling change in knowledge, attitude and practice.⁵ We evaluated the program through a mixed-methods approach, using responses from the predisposing activity (pre-work), evaluation forms, reinforcing activity (post-work) and a qualitative assessment, wherein participants were contacted for interviews to obtain an in-depth understanding of changes implemented into clinical practice, and of facilitators and/or barriers to clinical changes. Associated causes regarding application of change to clinical practice were also investigated. The program evaluation was approved by an independent Institutional Review Board (IRB) consistent with ethical principles outlined in the Australian National Statement on Ethical Conduct in Research Involving Humans (2007), to ensure anonymity of participants and confidentiality of the information collected.

Control was obtained by a within-subject design wherein immediate post, and 2-months-post change data were contrasted to the pre-assessment findings. Qualitative data were analyzed using thematic analysis method, N-Vivo 7.0 software (QSR International, Cambridge, MA). Quantitative data were analyzed using frequencies and cross-tabulations using SPSS 22.0 software (SPSS, Chicago, IL). Aggregate data collected through the two methods were triangulated for a reliable, comprehensive and trustworthy report on the outcomes achieved by this program.

RESULTS

PRINCIPAL FINDINGS

With a target of 500 registrants, we received a total of 624 registrations for the program: 300 completed both the predisposing activity and Module 1 (179 GPs, 121 pharmacists); of these 147 proceeded to complete Module 2 (67 GPs, 80 pharmacists), 137 continued to Module 3 (102 GPs and 35 pharmacists), and 132 eventually completed the entire program including the reinforcing activity (98 GPs and 34 pharmacists). Although we encouraged the sequential completion of the modules, we allowed 52 participants who have completed only the predisposing activity to attend the meeting (Module 2) and asked them to complete Module 1 after the meeting if they are interested in obtaining 40 Category 1 points; 25 participants attended ONLY Module 2. (Figure 2).



GP, general practioners, Ph, pharmacists, DMD, dentist

FIGURE 2. REGISTRATION AND ACTUAL PARTICIPATION AND COMPLETION OF THE MOTIVATE PROGRAM.

Although 132 completed the program, only 129 were included in the analysis as the three participants completed the program after data were submitted to AXDEV for analysis. Of those who completed the entire program (n=129), 80% said that the learning objectives were fully met, 88% rated MOTIVATE as entirely relevant to their practice; 83% said that their learning needs were met (Table 1).

TABLE 1. ACHIEVEMENT OF PROGRAM OBJECTIVES.

Program objective	Observed changes	Achievement of objective
Define MOH including the agents that are likely to cause this based on the ICHD-III diagnostic criteria	Increased awareness and knowledge	Met
Identify patients susceptible to MOH	Increased knowledge Increased confidence	Met
Develop integrated prevention and management skills, such that when MOH is recognised: <ul style="list-style-type: none"> – pharmacists are able to motivate patients to seek the help of GPs, and – GPs are able to develop an appropriate management plan and effectively communicate this to the patient 	Increased knowledge Some reported practice changes implemented	Partially met
Put a system in place so that patients are made aware of their susceptibility or risk of MOH	Increased confidence Some reported practice changes implemented	Partially met

Participants reported increased awareness and knowledge of MOH after the program, increased knowledge with regard to MOH diagnostic criteria. Compared with 50% of GPs who reported *not so or not at all confident* with their knowledge of withdrawal symptoms, 80% of the participants correctly identified all four withdrawal symptoms of MOH.

After completing the entire program, the participants reported increased levels of confidence in diagnosing headaches in general, in identifying the risk of MOH, in their ability to educate or inform patients about MOH, and in setting up appropriate referral systems to headache specialists. Almost all (98%) of the participants reported making at least one change in their practice, with regular tracking of medication and improved patient education and communication as the most common (Figure 3).

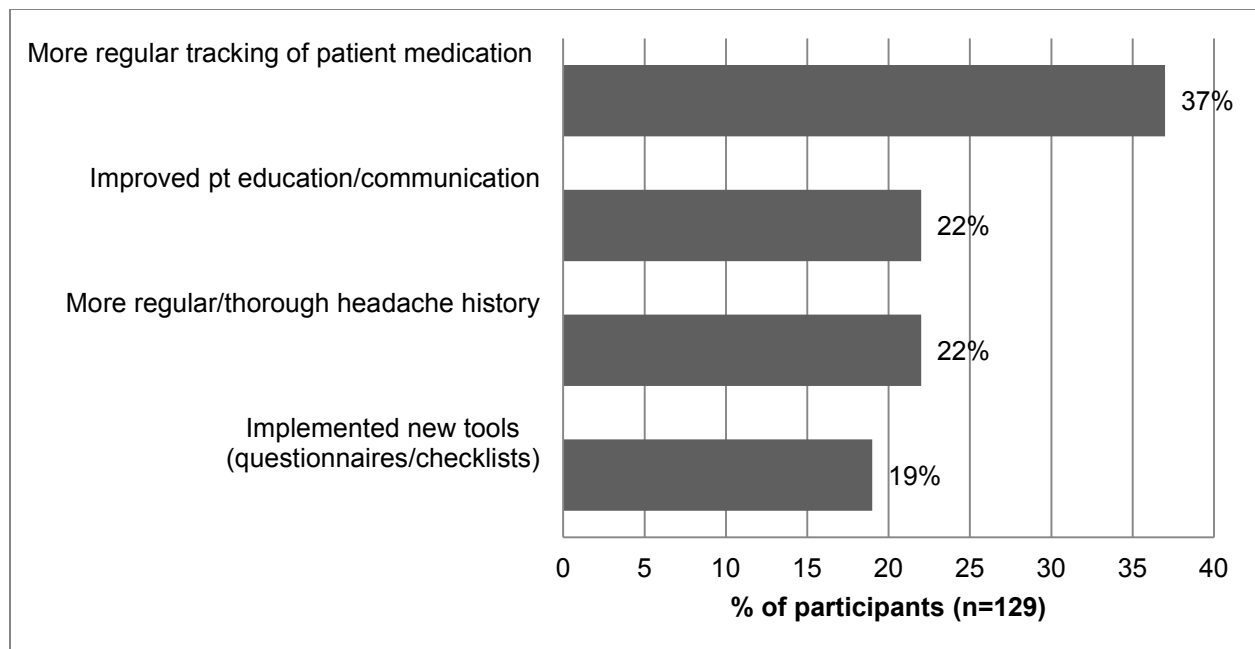


FIGURE 3. CHANGES REPORTED MOST FREQUENTLY BY PROGRAM PARTICIPANTS

Patient's resistance or fear was the most frequently reported barrier to implementing change in clinical practice (32% GPs, 41% pharmacists), that is, patients are reluctant to discuss medication use and discontinue use of medication.

Qualitative data from evaluation forms

Figure 4 shows the participants' responses to the question "What key learnings did you gain from this activity?" in the evaluation form.

Knowledge

"I'd heard of the concept of MOH but I didn't really know the details. What to describe to patients, what sort of things I should be looking for, what are the risk factors. So pretty much all of it was new to me....Changed the way that I look at analgesia."

– Pharmacist

"Before I entered the program I really hadn't thought very much about MOH, it was never mentioned in medical school."

– GP

"I really didn't dwell on it beforehand at all. I don't know that I really warned people prior to doing the program about the potential for the problem. Whereas now I do."

– GP

"The first important takeaway is the diagnostic criteria and algorithms. So the program made that very explicit and clear. Previous journal articles that I had read about chronic headache, it wasn't so clear but the program made it very clear"

– GP

"It made me realize that more people than I, that it wasn't all that hard to fall into that pattern. 10 pills a month is not that much when you think about it. If you're just taking a dose of medication once every three days, lots of people could potentially be taking that much medication. Far more people with migraine than I had previously thought could potentially fall into that category."

– GP

"I have a better rapport with my patients....I can really talk to patients and explain about withdrawal symptoms"

– GP

Confidence

"I am more confident. Right now I am really more confident about my diagnosis."

– GP

Performance

"Before I would not have picked [MOH] up whereas now I'm on the hunt for it. So when they say they're using a lot of PRNs or a lot of analgesia I'll say "How much are you using? If you stop taking it do you get rebound headaches?"...It's given me something more to talk about with the patients."

– Pharmacist

“I now take a basic headache history...I just quantify it more than I did before. So instead of vaguely “what medication do you take?”...I actually ask them how much and when and so on. That’s the main difference. And obviously warn them if they are taking OTC medications that it is not without risk and give them strategies so that they don’t fall into the trap.”

– GP

“Patient’s aren’t open to discussing their medication use - some people feel judged or defensive. It’s getting over that initial wall that poses the most difficult hurdle. After that, as long as you have the patient’s trust, it becomes easier to work with them in reducing their headache medication use.”

– Pharmacist

“I hadn’t really thought through what the patient’s reaction would be to being told that they are taking too much medication. The whole idea that they are thinking that I was just thinking they are drug addicts hadn’t really occurred to me before because I don’t see them as a drug addict...That was interesting”

– GP

General comments about the program and suggestions

“Congratulations on a well-designed program on a neglected topic.”

“This was a great program that made me think and was the best program I have done for some time.”

“I would like to thank everyone involved in preparing this comprehensive course which has been very educational it has changed my practice for the management of headache patients.”

“Having the specialist neurologist speak at the face to face meeting was very important.”

“Great learning activity to have GPs and pharmacists together.”

“Publicity [among GPs] was limited, which was a pity.”

“Excellent workshop. Could be available to wider pharmacy education via Pharmacy Guild Academy.”

“Repeat discussion about use of current learning of MOH in the next 12months.”

OUTCOMES

Combining, quantitative, immediate-post evaluation data, qualitative and 2-months-post data, we conducted an outcomes assessment of the impact of the program on the participant's knowledge, skills, confidence, and clinical practice behaviors. These data correspond to Moore's Expanded Outcomes Framework of assessing CME activities (Figure 6).⁵

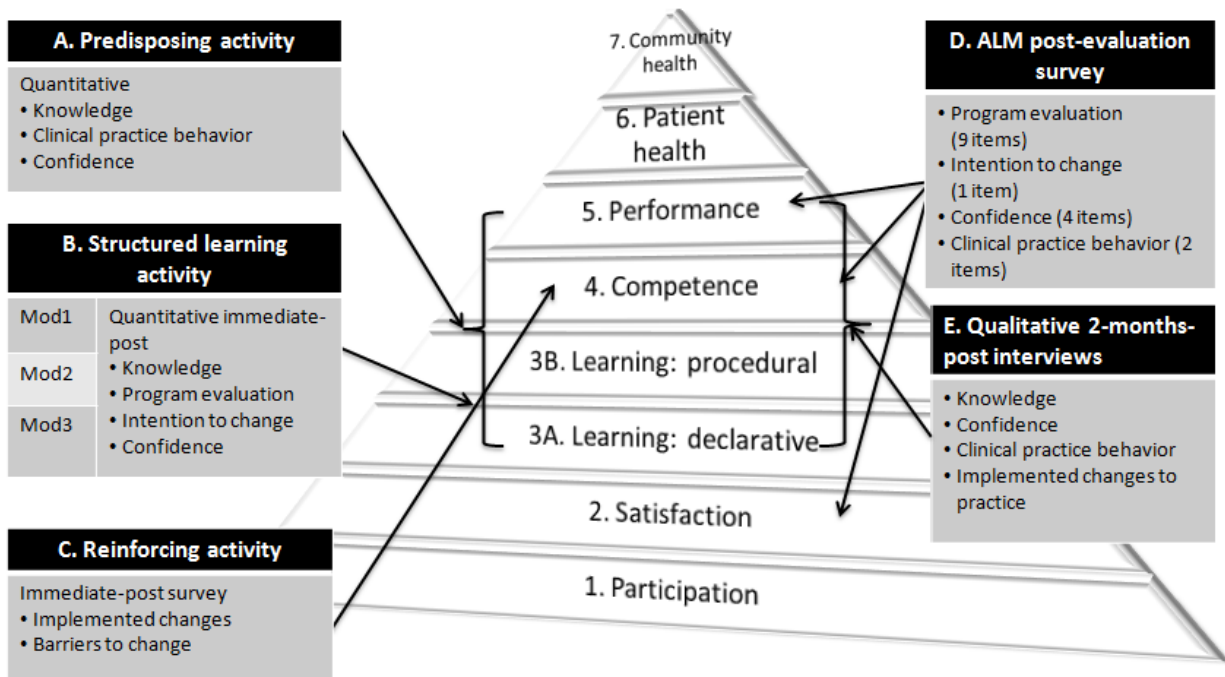


FIGURE 6. OVERVIEW OF OUTCOMES ASSESSMENT.

Table 2 lists the findings of the outcomes and formative assessment identifying areas for improvement for the different components of the program, particularly in the planning, development and deployment of the program and recruitment and enrolment of participants; internal and external perceptions of the initiative; and the collaborative process.

TABLE 2. OUTCOMES AND FORMATIVE ASSESSMENT AND CAUSALITIES

Lack of awareness and prioritisation in primary care	<ul style="list-style-type: none"> Formative assessment found an under-recognition of MOH amongst primary care physicians <ul style="list-style-type: none"> Lack of awareness regarding MOH Not seen as a priority issue
Issues related to current continuing medical education context in Australia	<ul style="list-style-type: none"> Recruitment of participants for educational programs traditionally done by industry representatives through their relationships with physicians Challenging to get people to understand nature of the program (i.e. Independent Medical Education) Without this pre-defined network of potential participants, In Vivo required additional resources to identify/develop lists of participants
Lack of understanding by target audience of the program focus and participation requirements	<ul style="list-style-type: none"> It was reported that invitation materials could have been clearer: <ul style="list-style-type: none"> The program focus was not headaches but more specifically MOH Amount of effort required from participants could have been better defined Description of interprofessional aspect of the program could have been more clear Completion of the program requires participants to return to practice and apply program learnings, but not all participants had the opportunity to apply program learnings to an MOH patient in practice
Technical difficulties with the online modules	<ul style="list-style-type: none"> Some course responses appeared to not register and participants would need to restart Could have impacted participant's willingness to continue to complete the program
Perceived relevance of select program modules to practice	<ul style="list-style-type: none"> Steering Committee members reported a review of the final program materials would have been beneficial to smooth out any remaining issues: <ul style="list-style-type: none"> A last review of the content would have allowed for the additional comments: <ul style="list-style-type: none"> Inclusion of more interactive components for the live session (Module 2) Adapting content of Module 1 to ensure its relevance for primary care providers

DISCUSSIONS

Feedback received from the participants of the MOTIVATE program confirms the lack of awareness and training on MOH among GPs and pharmacists in Australia. Of those who are aware, the lack of confidence prevents them from managing MOH patients themselves, and would rather opt for specialist referral. This lack of knowledge also hinders them from educating patients who are or may be at risk of MOH.

We believe that using the ALM, or predisposing–enabling–reinforcing instructional framework was the most appropriate educational design to address our needs assessment and to achieve our desired outcomes. This also integrates well with the 5-stage physician learning model described by Moore et al: (1) recognising an opportunity for learning; (2) searching for resources for learning; (3) engaging in learning to address an opportunity for improvement; (4) trying out what was learned; (5) incorporating what was learned.⁵

The predisposing activity of asking participants to recall a patient or client with frequent headaches allowed them to realise how they usually obtain headache histories in practice (e.g. do they ask the number of days per month the patient has [or no] headache? Do they ask for the name of medication?). This helped the participants recognise a “teachable moment”, and we hoped, an interest to pursue the subsequent modules.

Our Steering Committee members, consisting of a neurologist, a GP, two pharmacists and a psychologist, recommended that it was necessary to start the structured learning activity or the enabling activity with the basics of MOH, and so Module 1 (“Fundamental concepts of medication overuse headache”) supplied the knowledge by presenting the topics of epidemiology, the diagnostic criteria, patterns of MOH, managing withdrawals, identifying patients at risk, and educating patients. The content of this module, as well as the entire ALM, was designed to cater to both GPs and pharmacists, using an integrated, collaborative approach so that both groups understand each others’ roles.

Module 2 (“A case-study approach”) allowed them to engage with other participants and try out what was learned from Module 1, in a safe environment of case-based learning. It also served as an opportunity to obtain feedback from the neurologist who stood as facilitator, thus learning the difference between “what they are doing” and “what they should do to improve”, thus improving physician competence (Level 4). All participants received a participants’ booklet, which includes all the key points of the activity, and enough space to write down feedback from the facilitator and co-participants.

Module 3 (“Back at practice”) allowed the participants to apply their learning in their practice. We provided key pieces of information for use at point of care such as MOH identification flowchart, quick reference for motivational interviewing, MOH patient/client education checklist, and headache history forms.

For the reinforcing activity, we asked the participants to reflect and provide: (1) their insights from their patients’ responses on their awareness of their headaches and treatment; (2) what the responses of the patients tell them about the patient’s readiness to accept their condition and to shift treatment; (3) what the patient’s responses tell them about their fears/concerns about their condition, side effects, withdrawal and tolerance; and (5) the educational gaps that still need to be addressed, both for the healthcare professionals and the patients. Reflecting on

these questions, we thought, would help participants not only intend to or be committed to change, but also set off a continuous learning process and self-improvement.

Overall, the response to MOTIVATE was positive, in terms of the relevance and uniqueness of the topic (we did not find any recently advertised accredited CPD activity on MOH in Australia and most participants commented that headaches are rarely covered in CPD despite being a common condition in primary care) and the interprofessional nature of the activity, especially the combination of GPs and pharmacists in one activity. Summative assessments indicate that the activities' objectives were fully met, that MOTIVATE was entirely relevant to their practice, and that their own learning needs were met. Participants also reported increased confidence in diagnosing headaches in general, identifying patients at risk of MOH, ability to educate or inform patients about MOH and setting up appropriate referral systems, if needed.

Formative assessments indicate that the low completion rate was due to some of the participants' view that completing the program after Module 2 ("A case-study approach") and receiving feedback from the neurologist facilitator were enough and had already met their learning needs. Especially if they do not see MOH as a priority issue, completing Module 3 ("Back at practice") and the reinforcing activity was considered extra unnecessary work. Some GPs also informed us that they do not feel the need to complete the entire program due to their already having enough points to meet the requirements of the RACGP and so would only want to attend the meeting with the neurologist to earn Category 2 points.

Recruitment of participants also proved to be challenging due to GPs – and pharmacists even more – being unfamiliar with the concept of independent medical education. Recruitment of participants to CPDs, including registration and reminders, is traditionally done by industry representatives through their relationships with physicians. Without this pre-defined network of potential participants, we had to identify and develop lists of participants and invite them more aggressively, and making sure that we are connecting with them effectively through simple, direct (as GPs are known to be busy and receive numerous invitations) but attractive messaging. However, because of this desire, some important information (e.g. about the main focus of the program or the amount of effort required from participants) in the invitation or in the website may have been lost.

Face-to-face meetings remain to be the most popular form of CPD activity in Australia despite the growing popularity of online learning courses. Yee et al. reported that 83% prefer face-to-face lecture-based formats compared with 55% who prefer online self-education.⁶ The online component of the program could have impacted on the participants' willingness to complete the program.

We received comments from participants that Module 1 "was tough", in that it included difficult concepts and presentation was too academic. The Steering Committee members believed that an additional review of the program could have helped in smoothening out any issues, include more interactive components, particularly for the face-to-face meeting, and adapt the content of Module 1 to improve its relevance for primary care providers. While this may indeed be beneficial, the budget could not stretch to this additional round of review. Involving a non-academic, practicing GP or pharmacist to review the final materials should also have been considered, as well as piloting the entire program to a small group of the interprofessional target audience. However, the issues of budget and time constraints prevented this procedure. Targeting fewer participants would have been a better option had we anticipated the need for further review of materials to ensure better quality experience for our audience.

CONCLUSIONS

The MOTIVATE program effectively narrowed the gaps in knowledge, attitudes and systems in the prevention, diagnosis and management of MOH in Australian primary care. We believe that MOTIVATE may be the first independent medical education program offered nationwide to GPs and pharmacists together and may transform the way future CPD activities are developed and delivered in Australia. A clinical perspective of MOH in Australian primary care, authored by the Steering Committee led by Assoc/Prof Richard Stark, was developed as a letter to the editor and has been submitted to the *Medical Journal of Australia*. We are also currently writing a manuscript describing our unique experiences and learnings from developing and deploying MOTIVATE and plan to submit this to the *Journal of European CME*.

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