

BMJ Open Clinician attitude towards safety in medication management: a participatory action research study in an emergency department

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ABSTRACT

Objectives Medication management is a process in which medications are selected, procured, delivered, prescribed, reviewed, administered and monitored to assure high-quality patient care and safety. This paper explores clinicians' attitudes towards medication management which is both open to influence and strongly linked to successful changes in medication behaviour. We aimed to investigate effects of engaging in participatory action research to improve emergency medicine clinicians' attitudes to safety in medication management.

Setting Emergency department of one university affiliated hospital.

Participants A total of 85 clinicians including nurses and physicians partook as participants. Eight managers and clinicians participated as representatives.

Design Data are drawn from two-cycle participatory action research. Initially, a situation analysis on the current medication management and clinician views regarding medication management was conducted using three focus groups. Evaluation and reflection data were obtained through qualitative interviews. All qualitative data were analysed using content analysis.

Results Clinicians initially expressed negative attitudes towards existing and new plans for medication management, in that they were critical of current medication-related policy and procedures, as well as wary of the potential relevance and utility of potential changes to medication management. Through the action research, improvement actions were implemented including interprofessional courses, pharmacist-led interventions and the development of new guidelines regarding medication management. Participants and their representatives were engaged in all participatory action research stages with different levels of involvement. Extracted results from evaluation and reflection stages revealed that by engaging in the action research and practice new interventions, clinicians' attitude towards medication management was improved.

Conclusions The results support the impact of participatory action research on enhancing clinicians' positive attitudes through their involvement in planning and implementing safety enhancing aspects of medication management.

Strengths and limitations of this study

- The participatory action research protocol successfully engaged participants and provided in-depth situation analysis of a specific context in order to inform action planning and implementation.
- The research team applied rigorous methods to enhance the validity of results.
- Extracting results from one setting can be a limitation as there is a risk that results will not be fully generalisable.

BACKGROUND

Medication management reflects a process in which medications are selected, procured, delivered, prescribed, reviewed, administered and monitored to assure high-quality patient care,¹ which has been evidenced as a strategy to address patient safety challenges related to medication errors.² This approach is essentially multidisciplinary and typically involves a range of healthcare clinicians including pharmacists, nurses and physicians.³

Medication safety is the process and the product of medication management and relies heavily on a strong safety culture. Building a safety culture involves building alignment between individual, group and institutional values related to safety, which impacts attitudes, perceptions and generally the patterns of behaviour of clinicians.⁴ To achieve patient safety as a primary outcome of medication management, we need to focus on two constituent structures of safety culture, including safety climate and safety tools. Safety tools refer to all types of safety procedures and tools that physically develop the safe environment,⁵ while safety climate refers to shared perceptions and attitudes of clinicians concerning safety as a priority.⁶ Safety climate is a unit-level construct and

represents individuals' collective perception of safety priorities and practices in their organisation.⁷

Predominantly, from a managerial perspective, establishing safety tools might be considered a sufficient component for medication management. However, clinicians' attitudes and behaviours are likely underestimated by an explicit emphasis on safety tools. Since clinicians act as clinical leaders in the healthcare settings, their attitudes are likely to be a determining factor for successfully implementing safety initiatives.⁵

The emergency department (ED) is a hospital setting that poses many patient safety challenges, including highly unpredictable conditions and frequent use of high-risk medications.⁸ These conditions increase the risk of medication errors.⁹ This study contributes to the broad literature on medication management and medication safety in the healthcare settings, especially EDs. To address factors contributing to medication errors and medication safety, a wide range of recommendations have been proposed such as improving interprofessional and team communication, double checking for high-risk medications,¹⁰ adherence to well-known and approved medication guidelines,¹¹⁻¹³ technology-based medication therapy systems¹⁴ and employing clinical pharmacy services.¹⁵ Such recommended strategies are aimed at improving safety in medication management, without guaranteeing safety.¹⁴ However, the medication management process remains high risk and error prone.^{16 17}

This study employs participatory action research (PAR) with the aim of facilitating medication management implementation and driving a process of collaborative enquiry. PAR is an approach which facilitates change through involving participants and focusing on their attitudes.¹⁸ PAR has been demonstrated to engender positive attitudes on the basis of organisational citizenship, including in healthcare settings, and increases clinician perceptions of self-worth and competence.¹⁹

We aimed to address the following question: Can engaging in PAR improve clinicians' attitude towards medication safety and medication management in the ED? The underlying purpose of this study was to use PAR methodology to collaboratively explore and implement ways to improve safe medication management in the ED by strengthening clinicians' attitude regarding the medication safety.

To the best of our knowledge, the extant literature lacks consideration of the role of clinician attitude in establishing effective medication management interventions in the ED. In particular, no action research has been undertaken on this topic which limits our knowledge of the processes that may contribute to successful medication management intervention development and participative implementation.

METHOD

We used a model of PAR incorporating cyclical activities based on Kemmis and McTaggart.²⁰ PAR cyclical activities

include observation, reflection, plan and action. The PAR approach provided us with the opportunity to involve clinicians and concurrently consider their attitudes towards medication management and its influence on ED safety culture.

Research setting

Action research in healthcare is considered as a transformative approach that continuously innovates in healthcare.²¹ Based on the research aim, design and population, this approach may seek to improve the work life of those who deliver care through a single or multiple institution setting.²² The study setting was an ED of a public hospital and trauma centre. The 32-bed emergency unit provided comprehensive emergency patient care. The ED clinicians include nurses, specialists in emergency medicine and emergency medicine residents.

Participants

Participant involvement was initiated subsequent to the identification of the research question. We used an intentional sampling method to recruit ED clinicians.²³ Since it was impossible for all ED clinicians to participate in every PAR stage, our study was organised around two levels of participation. All recruited clinicians were study participants. However, based on the degree of their involvement with action research project, we indicated them as 'representatives' or 'participants'. Clinicians with a greater degree of participation were termed 'representatives'. Representatives are participants who are tasked with representing their professional and occupational group. Representatives were asked to connect with other clinicians so that their input was more broadly representative rather than an individual perspective only. Representatives contributed directly and acted as boundary-spanners, connecting to other participants throughout the study. These representatives collated and conveyed information regarding perceptions and attitudes of other participants. Representatives were selected using purposive sampling and included both formal decision-makers (eg, clinical and administrative leadership) and managers or clinicians who routinely engaged in ED activities (ED nurses and physicians). All other clinicians with lesser degree of involvement called 'participants'. They were selected using total population sampling. Participants were heavily involved in the implementation of the new study actions and in feeding their perceptions and suggestions to representatives.

The hospital management and leadership team acknowledged the importance of improvement in medication safety in the ED. They actively collaborated with the research team and participants, provided adequate financial support and enabled the implementation of complex changes.

Potential participants were first provided with an outline of the proposed study by the researchers and then invited to participate. The study was contextualised by first discussing the importance of medication safety and

Table 1 Methods of PAR phases in this study

	Stages	Activities	Performers	Periods
Phase I	Situation analysis	Three FGDs for context analysis	Representatives (n=8)	September–October 2018
	Plan	PCG planned actions for promoting MM	PCG (n=8) and research team (n=3)	November 2018
	Action	Planned actions performed by ED clinicians	All participants (n=85), representative (n=8) and research team (n=3)	From December 2018
	Observation	Forth FGD	Representatives (n=8)	March 2019
	Reflection	Reflecting on implemented actions	Participants (n=9)	April–June 2019
Phase II	Replanning	Developing new strategies for improvement in MM by PCG	PCG (n=8) and research team (n=3)	April–June 2019
	Action	Implementation of planned strategies	All participants (n=85)	From July 2019 to October 2019
	Observation	Evaluation on implemented actions by informal interviews	Representatives (n=8)	
	Final reflection	Reflect on progress, advantages and changes related to improvements by MM	Participants (n=10)	November 2019

ED, emergency department; FGD, focus group discussions; MM, medication management; PAR, participatory action research; PCG, professional codevelopment groups.

the hospital's commitment to medication management and their involvement. The research team also provided clarification through individual of group meetings.

We informed participants that their participation was entirely voluntary, that they would not be disadvantaged if they chose not to participate, that all data would remain confidential and that they had the option for refusing to answer any question and terminating participation at any time. Participants signed a written consent form prior to participation.

Data collection

Data were collected from August 2018 to October 2019. A qualitative methodology was used for data collection, specifically face-to-face focus group discussions and interviews. Focus group and interviews gave voice to clinicians' attitudes, priorities and preferences. As mentioned above, representatives in both PAR phases actively involved to convey the voice of all participating clinicians to address the study aim. [Table 1](#) illustrates the two phases of PAR, their stages, timeline for each stage and the clinicians who participated in each stage as representatives or participants.

Phase I

Stage 0: informal preliminary interviews

Prior to initiating the formal study, we conducted informal interviews. More specifically, we asked clinicians to describe features of their work environment related to medication management and their perceptions regarding change readiness. We aimed to identify their initial attitudes and the existing safety culture related to medication management. Participants consistently noted the absence of well-organised medication management and some weaknesses in safety behaviour which they linked to limited safety tools and poor safety climates. They voiced concerns regarding the potential for new medication management initiatives to be developed and

implemented, largely attributed to their lack of knowledge and power.

Stage 1: situation analysis

In the initial PAR stage, we analysed the current safety culture and clinicians' attitudes related to medication management by implementing three focus group discussions. We developed a focus group discussion guide²⁴ based on preliminary data gathered. Next, we distributed the guide to representatives. To initiate each focus group the facilitator (FB) welcomed invitees and presented an introduction. Then, the focus group logistics and guidelines were articulated. The main focus group questions are listed in [table 2](#).

Stages 2 and 3: plan and action

In the second stage, a professional codevelopment group was established.²⁵ The group members were the same representatives. The aim of creating the group was to involve clinicians' in the development and implementation of changes. First, the group members established and implemented a process for selecting actions which focused on feasibility in the context of existing resources. The group determined actions using the analysed data of focus group discussions. Second, the group developed interprofessional plans for implementing selected actions. Actions were accomplished in stage three of the PAR and involved all ED clinicians. The hospital management team provided financial support to enable the implementation of selected actions.

Stage 4: observation

We organised a fourth group discussion to evaluate participants' attitudes regarding the new actions for medication management. We aimed to study, assess and observe the implemented actions. Similar representatives as in stage one took part. A summary of previous stages was

Table 2 Questions used in the individual interviews and focus group discussions

Phase/ stage	Questions
Phase 1/stage 1/focus group questions	How would you describe the medication management in the ED? During recent years, did you see any change in medication management? What is your opinion about improving plans for medication management? What strategies would facilitate implementing new medication management programs?
Phase 1/stage 2/focus group questions	How would you describe the new changes in medication management? Do you detect any improvement regarding medication therapy by ED clinicians? Do you ever have concerns about your role in processing safe medication therapy? What is your assessment of other professionals and their role in medication safety? Did you experience changes in the collaborative climate of the ED? How would you describe the medication management in the ED?
Phase 1/stage 5/individual interview	Did the new actions make differences regarding medication management? How much did the actions influence your attitudes about medication management in ED? Were the actions justifiable based on the current conditions in ED? To what extent has your input been reflected in new medication management actions?

ED, emergency department.

provided. The main focus group questions at this stage are mentioned in [table 2](#).

Stage 5: reflection

Reflection in PAR aims to clarify the issues, progress and developments in the subject under research. To this end, interviews were conducted with participants across different shifts. We used an interview guide that was developed based on previous stages.²⁶ The main open questions in the interviews are listed in [table 2](#). Based on progression of interviews, exploratory questions were asked. Each interview ended with reflecting and summarising.

Phase II

In the second phase, the data derived during first phase reflection directed the professional codevelopment group to develop new and amended strategies to best address the study question. Newly designed actions in second phase were implemented by participation and involvement of ED clinicians. Next, we conducted semi-structured interviews to observe and evaluate clinicians' attitudes regarding the implementation of new plans. We asked participants the same questions as in the observation stage in the first phase. The question 'were you satisfied with the new guidelines in medication management?' was added, related to the new actions that were implemented in the second phase. For the last stage, a final reflection process was undertaken in a manner similar to the first phase.

The principal researcher (FB) who is experienced in qualitative interviewing conducted the interviews. During interviews field notes were taken to enable content analysis. Each group discussion lasted 1–2 hours and interviews took 20–30 min.

Data analysis

All focus group discussions and interviews were audio recorded and transcribed with permission. Transcripts of group discussions and interviews were analysed based on conventional qualitative content analysis drawing on the Graneheim and Ludman's method.²⁷ Since each PAR stage was directed by specific aims and interview

questions, analysis of group discussions and interview transcripts was stage based.

To ensure coding agreement and address inter-rater reliability,²⁸ we double coded the first group discussion transcript (20 pages). There was 85% agreement between two reviewers. After reviewers completed coding of all transcripts, differences in coding between two reviewers were resolved through research team and participants discussion. MAXQDA software V.18 was used to manage the data. Data saturation was the main criteria to end the interview process.

We sought to maximise rigour and trustworthiness by adopting the Guba and Lincoln guidelines to ensure the reliability of the results.²⁹ Participant checks for accuracy of data were implemented by discussing findings and interpreted data with participants. Multiple data sources were used to enable data triangulation and clinicians from nursing, medical and pharmacy professions were provided with data and analysis to ensure inter-professional views were accurately captured. Multiple researchers in the research team participated in different phases of PAR.

Patient and public involvement

The study was an action research with clinician participation, without patient involvement. Due to the study design, participants were invited to comment on the study design, develop new actions and related outcomes, and interpret the results. Three representatives also contributed in the writing process of the document to ensure the accuracy.

RESULTS

The main findings of two phases of the PAR are presented in this section. Participants included specialists in emergency medicine (n=12), emergency nurses (n=55) and emergency medicine residents, postgraduate physicians who practice emergency medicine under direct supervision of a specialist in emergency medicine (n=20). Two specialists in emergency medicine, two clinical and

educational supervisors, two experienced ED nurses, one nursing faculty member and one clinical pharmacist were representatives (n=8).

Phase I

After analysing focus group discussions, two major themes with subthemes were extracted from discussions: (1) Attitudes towards medication management and (2) Facilitators of medication management.

Attitudes towards medication management

This theme shows the initial attitudes and perspectives held by clinicians regarding safety in medication management. Representatives described feeling responsible for medication safety. However, they perceived unfavourable conditions and reported mostly negative attitudes towards implementing new plans for medication management in the ED.

Discontinued implementation of new medication management approaches

In some situations, medication management procedures, even those that were relatively recently implemented, were changed due to the appointment of a new manager. This led to a negative attitude towards new plans.

‘Sometimes before we adopt new plans, the new manager comes and try to change it, so we prefer to stay in routines... accepting change and aligning with it is a time-consuming process. Regarding medication management this become more complicated... We know that literatures rapidly provide us with new interventions and theories about medication safety, but we need more time and space to adapt with them... moreover, changes must be continuous not interrupted’ (Focus group discussion 2)

Attitude towards superiors

The importance of respective status differentials between managers and clinicians was mentioned by all representatives. This reportedly induced humiliation and reluctance in many clinicians to expressing their negative perceptions regarding existing medication management approaches.

I’m reluctant to complain about current medication management conditions to my superiors, because it may offend him... look, some managers aren’t receptive of critiques or advances from their staff in the inferior institutional positions... he may be more experienced, but not certainly the most knowledgeable one! Most of us have experiences of negative feedback when telling our views... we don’t want to experience it more (Focus group discussion 1)

Medication therapy in complicated moments

Participants questioned the responsiveness of medication management process, particularly during ED high volume periods.

How about the shift works that we concurrently are surrounded with lots of acute patients? How is medication management applicable in these situations? (Focus group discussion 1)

Facilitators of medication management

Several facilitators were identified as potentially supporting the improvement of medication management and positive attitudes towards improving medication management. The extracted facilitators directed participants and research team to initiate appropriate interventions regarding safety of medication management in the ED concurrent with improving clinicians’ attitude.

Medication safety training

Representative endorsed that, when clinicians become more knowledgeable about medication therapy and medication management, they are more likely to participate in the improvement of medication management plans.

The more effort is put into pharmaceutical education, the more people’s knowledge and perception of safe medication will be improved (Focus group discussion 3)

Enhancing a system-oriented perspective

Participants stated that to benefit from medication management, a shift towards system-based practice was required. This suggested the benefit of sequential medication management steps and the application of resources to provide medication therapy that is of optimal value.

...medication management is a systemic function, the more holistic we consider it, the better we will achieve... (Focus group discussion 3)

Interprofessional collaboration

Participants perceived that interprofessional forums, education and practice are required to allow clinicians from different professions to understand each other roles regarding medication, which would facilitate greater collaborative work.

The medical and nursing professionals need to recognize each other’s responsibility... when we are knowledgeable on the other professions’ role through the medication management, so we can do it collaboratively... (Focus group discussion 3)

Clinical pharmacist in place

Participants emphasised incontrovertible role of active presence of clinical pharmacist to build safer medication management. Clinical pharmacist’s guide and feedback assumed to embedding improved medication safety attitudes.

Clinical pharmacists affect the whole medication therapy process... we need them in many steps to process safe medication management... they are not limited

Table 3 Implemented actions in stage 3 of phase I

Action	Responsible lead	Purpose	Activities	Target group	Timelines
Interprofessional courses on MM	Clinical pharmacist, head of ED and educational supervisor	To share knowledge of MM guidelines for providing collaborative integrated medication therapy	Teaching main topics of MM with focusing on: Guideline-based prescribing and administrating, medication errors and reporting, medication safety and patient adherence to MM	All clinicians in the ED	From December 2018 to end of February 2019
Placement of clinical pharmacists in ED	Clinical pharmacists	To develop a pharmacist-led MM in ED	Reviewing prescriptions of specialists and residents, reviewing administration of nurses, filling designated checklists for each review, supervision on double checking of high-risk medications, providing information and feedbacks to clinicians and patients	All clinicians in the ED	From December 2018

ED, emergency department; MM, medication management.

to dispensing step or calculating some medication doses... we need their constant feedback, training, reconciliation and many other tasks to help with safer medication therapy (Focus group discussion 2)

Actions in the first phase included interprofessional courses on medication management and placement of clinical pharmacists. Clinical pharmacists led the actions and all ED clinicians participated collaboratively. Due to clinical pharmacist shortages, we were unable to dedicate clinical pharmacists to the ED. However, additional supports were introduced by hospital leadership to enhance clinical pharmacy services in the ED. Specifically, two additional clinical pharmacists were hired to ensure that a clinical pharmacist was present in the ED for at least 6 hours per day and available to provide remote telepharmacy services for the remaining 18 hours. The planned and implemented actions in phase I is described in [table 3](#).

The fourth focus group discussion was run for observing the impact of actions. During this session, representatives discussed their experiences and attitudes towards new medication management procedures. These qualitative data focus on the extent to which first phase interventions were likely to improve safety in medication management. Major categories derived from this group discussion were as follows:

Increased willingness to adhere to medication management protocols

After training and interactive discussions, clinicians were encouraged to adhere to medication management protocols.

...now we're noticed about the importance of guidelines. Before the courses we considered them as boring written materials... (a nurse with 7-year experience)

Motivated medication error reporting

During training, medication error scenarios were presented, which assisted clinicians to recollect similar situations and recall their mistakes. Hence, they were

motivated to and confident to report their medication errors.

...presented cases about medication errors were great, we imagined ourselves in those situations ... (a nurse with 12-year experience)

Clinical pharmacist in the core of interprofessional collaboration

As clinicians became aware of each other's roles, they were more committed to participating in new medication management procedures. They believed that the active role of clinical pharmacist in the ED and telepharmacy services, played important role in the enhanced safety.

...now I believe that medication management is like a puzzle and healthcare professionals should try to solve it collaboratively... we really were ignoring the great role that clinical pharmacist could play... mostly, physicians and specialists believe that their pharmaceutical knowledge is sufficient and up-to date to provide error-free prescriptions... that's completely a wrong idea... clinical pharmacist are more expert in this area and they are experienced to link different steps in medication therapy... they complete our teamwork with nurses... (an emergency medicine specialist with 8-year experience)

At 4 months postimplementation, informal interviews with nine clinicians (participants) were conducted to allow for reflection on new medication management procedures. Major extracted categories can be labelled into two groups:

Satisfaction with current action

- ▶ Well-informed clinicians: Participants reported being satisfied with the courses and training on medication guidelines. ED clinicians reported being more knowledgeable regarding safe and collaborative medication management.
- ▶ Robust medication safety: Clinicians stated that improved medication management had increased the robustness of medication therapy, such that peak

ED volume did not lead to disruptions in medication policy adherence.

Suggestions for new actions

- ▶ Context-based guideline development: Participants believed that the current instructions regarding medication management and safety-related issues needed to be better promoted. They deduced that general guidelines and instructions were not sufficiently contextualised and practical.
- ▶ Clinician-oriented actions: Although clinicians mostly emphasised that the PAR approach was indeed participative and they collaboratively managed medication therapy, they still felt potential for a more active role. They mentioned that actions in the first phase were mostly pharmacist led.

Phase II

Based on data gathered and analysed, especially suggestions for new actions in the reflection stage of the first phase, the professional codevelopment group decided to continue implementing new actions for an additional 4 months. They decided that the interprofessional courses on medication management needed to be continued to stabilise the newly created safety climate. Development of more structured, context-specific and evidence-based medication management guidelines reflected another action. This new guideline which was developed collaboratively by ED clinicians aimed to diminish the authoritarian approach induced by previous guidelines and help clinicians to promote an understanding of their important role. The actions that were employed in the second phase are summarised in [table 4](#).

We conducted six interviews in the second phase observation stage with representatives. Three main categories emerged from data analysis regarding participants' evaluation of new actions:

Safe medication therapy

Overall, participants assumed that new procedures improved medication safety.

If I want to make a comparison about medication management since last year, the most important change is more safety... yes... safer... we become more sensitive regarding high-alert medications... we do double checking more than before... we pay more time to adhere the medication therapy guidelines... me and most of my colleagues ask for medication information from clinical pharmacist or physicians when we are doubtful about a prescription... obviously we have less harmful or near miss medication errors (*a nurse with 9-year experience*)

Confidence

Through the PAR, clinicians developed confidence in the ability of share their opinions, especially regarding medication management.

...I think I have gained more courage to express my ideas for improving the system... (a nurse with 5-year experience...)

Observable outcome

Participants assumed that the new actions resulted in apparent and effective outcomes.

...there had been a lot of research and plans before, but usually the results were not very obvious, this time it was different... (an emergency medicine specialist with 4-year experience)

The final reflection stage was the final PAR component. This included results from informal interviews with 10 clinicians. Most of the participants indicated that the actions in both phases had improved medication management and patient safety. We classified findings into two groups:

Safety attitudes improvement related to medication management

Findings under this theme related to changes and improvement in clinician safety attitudes, perceptions and behaviours following new actions in the ED:

Table 4 Implemented actions in stage 2 of phase II

Actions	Responsible lead	Purpose	Activities	Target group	Timelines
Continuing interprofessional courses on MM as previous phase	Same as previous	To stabilise the newly created atmosphere about MM	Same as previous by emphasising on participation of new ED clinicians	All ED clinicians	From July 2019 (monthly)
Developing more structured and evidence-based guidelines for MM	Clinical pharmacologists in collaboration with research team	To develop more structured and context-based MM guidelines	For engaging other clinicians in the actions, an announcement about designing new MM guidelines were sent to their online portals. They were encouraged share their ideas. Then, the clinical pharmacist developed context-based MM guideline and rules. The changes were publicised in ED by permission of hospital management group.	All ED clinicians	August–September 2019

ED, emergency department; MM, medication management.

Interprofessional and intraprofessional teamwork

Collaborative implementation of actions affected clinicians' perception of safety climate and teamwork. Participants emphasised the role of teamwork as major element to progress medication therapy among and between medical, nursing and pharmacy professionals.

Psychological support

A more positive attitude not only resulted in safety-based practice, but also enhanced clinician well-being by limiting stress related to medication-related anxieties.

Communication pathway

Participants realised that managers facilitated more reliable communication. This accompanied perceptions of openness and support among clinicians related to sharing their views and concerns.

Perceived accountability

Participants perceived that no matter what profession or role, they are responsible for developing strong and positive safety attitudes regarding medication therapy.

Safety tool induced improvement in medication management

These findings related to the impact of newly introduced safety tools and related actions:

Respected professional competence

Involving participants and their representatives in planning and implementing actions, especially in the development of new guidelines as a safety tool was interpreted as respecting clinicians' professional competence.

Continuous improvement

Clinicians perceived that participating in courses and educational events led by pharmacists were important continuing in-service education that benefited their practice.

DISCUSSION

The initial results of the qualitative situation analysis revealed clinicians' negative attitudes towards changing the current medication management. Such negative attitudes would likely impede efforts towards medication management change.^{30 31}

Our study showed that participating in the PAR facilitated the development of clinicians positive attitude towards implementing new actions, particularly in relation to improving medication management in the ED. Through the PAR we engaged a range of clinicians, from managers to front-line clinicians to develop and implement new medication management actions. By employing PAR, we explicitly valued participants' competencies, empowered them to develop and implement changes, shared decision making and ultimately engaged their collaboration.³² Taleghani *et al* designed an action research aiming to empower nurses in providing palliative care. Results showed that, by creating positive change

in nurse's attitude through participating in the action research, participants were able to provide improved care through professional development.³³ Positively changed attitudes have also been reported in other action research studies suggesting the utility of PAR in shifting clinician attitudes towards new actions and facilitating sustained change.^{34 35}

During the first PAR phases, two important actions were implemented, including introduction of interprofessional courses on medication management by clinical pharmacist and placement of clinical pharmacists in the ED.

The analysed data from forth group discussion captured primary changes in clinicians' attitudes regarding medication management. Participants reported increased motivation to adhere to medication management guidelines, and recognition of the importance of interprofessional approaches to medication therapy. This is a particularly useful given a recent quasi-experimental study that reported significant improvement in medication safety behaviours followed by interprofessional education.³⁶ In addition, we found that pharmacists were useful mentors and guides to develop medication management skills and motivate clinician efforts to mitigate medication-related harms.³⁷ Brown *et al* underlined pharmacists' educational role to optimise medicinal practice.³⁸

Many studies in the ED settings strongly support the critical role of clinical pharmacists.^{39 40} In line with our study, they acknowledge clinical pharmacists' educational capabilities, and their role in reviewing and managing the safe medication therapy process.¹⁵ However, prior studies also indicate that emergency medicine clinical pharmacists,⁴¹ are typically not dedicated full-time to the ED.⁴² This issue is likely to be related to clinical pharmacy shortage and inadequate financial resources. However, our study indicates the value in ensuring that clinical pharmacists are physically present for a significant period, undertake training and provide supplementary telepharmacy service to the ED.

Through the second phase, the majority of participants were engaged to develop medication management guidelines. Results of our study showed that PAR participation engendered a perception of feeling useful, valued and confident, which contributed to the development of positive attitudes towards changed medication management guidelines. This result is consistent with literature which suggests that strategies which increase staff perceived control over particular situations, including interdisciplinary communication and collaboration are likely to strengthen their intention to change and positive attitudes towards intended behaviour.⁴³ For example, Sessions *et al* also reported that improving safety culture through the engagement of nurses contributes to improved medication safety.⁴⁴ Negative attitudes regarding medication management and deficiencies in interdisciplinary communication have been found to be significant barriers to effective medication management⁴⁵. Further, Motycka *et al*⁴⁶

found that enhanced attitudes towards teamwork significantly enhanced collaboration to improve medication management.⁴⁶

The study culminated with participants' reflection on the whole PAR. Participants emphasised teamwork psychological support and perceived accountability as new elements were central to the development of new medication management-related safety attitudes and climate. This aligns with a recent systematic review that reported teamwork, communication and management support to be central to positive safety attitudes.⁴⁷

In terms of study limitations, we gathered data in both phases qualitatively. Though this provides rich information, such an approach is not comprehensive and there is a possibility that some activities and responses related to clinician attitudes may not be captured. Clini *et al* raised this issue in their PAR.⁴⁸ Similar to many PAR studies,⁴⁹ the study also faced with time limitations. In the PAR carried out by Jokiniemi *et al*, participants reported being unsatisfied with the time the PAR ended.⁵⁰ However, participants in the current study expressed positive attitudes regarding safety changes in the medication management process. A further limitation relates to the institutional setting and suggests that future research could be directed to replicating these findings outside the ED and in a wider range of organisations, including aged care facilities.

As in previous PARs, clinicians were able to identify significant negative situational factors, many of which were systemic and affecting the ED safety culture and their negative attitudes towards medication management. Addressing difficulties related to systems is challenging and typically relies on broad healthcare reform.⁵¹ Clinicians' negative attitudes in this context can adversely aggravate perceived barriers to change and limit the effectiveness of healthcare leaders' change efforts.⁵² The more employees resist change, the less support they provide for quality improvement reforms including safety in medication management.⁵³ Our findings suggest that through a collaborative and cyclical PAR, participants experienced feeling that they were active participants in medication management-related changes. This collaborative and inclusive approach was able to overcome perceived barriers and limit resistance to change. This highlights the ability of PAR to influence clinicians' perspectives and attitudes (Landaeta, Mun, Rabadi, & Levin, 2008; Trebble *et al*, 2013).^{54 55}

It is useful to note some additional strengths and limitations. The current PAR process successfully engaged participants and provided in-depth situation analysis of a specific context in order to inform action planning and implementation. The research team applied rigorous methods to enhance the validity of results. However, extracting results from one setting can be a limitation as there is a risk that results may not be fully generalisable. However, it is likely that results will be applicable to other healthcare settings, as there are significant similarities between healthcare organisations and within EDs. In addition, there is evidence that clinicians may react

similarly to efforts to implement changes, and that these reactions vary on the basis of their involvement.⁵⁶

Implication for practice

Our findings provide an actionable path for healthcare managers, especially in the ED, to improve clinician attitudes to medication management safety. Consistent with other studies,^{57–59} our findings suggest that achieving safety in ED medication management through single, external interventions is less likely and recommend a multistep, collaborative approach. Our study suggests healthcare managers consider clinicians' attitudes as significant change drivers when developing and implementing new approaches to ED medication management. In addition, this study suggests that several initiatives were successful in increasing medication management. While these may be specific to the study context, we suggest that future study investigate the utility of the interventions such as full-time emergency medicine clinical pharmacists as well as the development of interprofessional and ED-specific medication management guidelines in enhancing medication safety.

CONCLUSION

In conclusion, healthcare leaders' efforts to improve patient safety approaches such as medication management, necessitates realistic and useful action plans, and their implementation relies on manager and staff effort. The ability to commence and sustain improvement initiatives in an organisation is directly affected by workforces' attitudes. Our findings suggest that extent to which healthcare leaders involve employees in the development of new medication management procedures and refocusing on concerns voiced by them directly effects their implementation and subsequent embedding. Since clinicians' experience significant stress in ED, launching new plans without their active involvement may exacerbate negative attitudes related to systemic challenges. Our findings suggest that PAR has the capacity to motivate the active involvement of diverse clinician groups enabling different viewpoints and expertise to be applied to the development of complex action plans.

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