Medication-Related Fall (MRF) Screening and Scoring tool: Consensus Delphi Validation

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Introduction

- Falls are a significant public health problem worldwide which constitute a major cause of injuries and injury-related admissions to hospital, emergency department visits, and mortality and result in increased healthcare resource utilisation and costs (1)
- Risk factors for falls are multifactorial and include medication use (1-3). Falls-related increasing drugs (FRIDs) are widely prescribed for older people and optimising their use has the potential for reducing the incidence of falls (2,3)
- The aim of this study was to develop and investigate the content validity of a medication-related fall (MRF) screening and scoring tool using a Delphi consensus validation approach

Methods

- The MRF tool was developed using the FRIDs listed in Polypharmacy Guidance, Realistic Prescribing 2018 (4). Further medications associated with increased risk of falls from various sources (such as BGS Falls Guidance (5) and the Beers' Criteria (6)) and clinical experience identified by specialist pharmacists and consultant physicians across Northern Ireland were added
- Medication classes were categorised as high-risk (three points), moderate-risk (two points) or low-risk (one point) in their 'potential to cause falls'. The overall medication-related falls risk for the patient was determined by summing the scores for all medications
- The MRF tool was validated using a Delphi consensus panel of experts
- Selection criteria for expert panel members included individuals with recognised expertise in geriatric medicine and pharmacotherapy in older people, comprising (i) senior-level experience in pharmacotherapy i.e., five or more years; (ii) publication in international peer-reviewed journals within the previous five years; and (iii) professor/senior lecturer/consultant status in the relevant discipline (geriatricians, clinical pharmacologists, clinical pharmacists, old age psychiatrists, general practitioners (GPs), researchers, and university academics)
- Three iterative rounds of online surveys were conducted using SurveyMonkey®.
- Each criterion was presented in the form of a statement, i.e., a medication/medication class followed by details regarding the mechanism by which each medication/medication class may increase falls risk
- The first round of the survey was piloted with three experts who met the inclusion criteria for the main panelists.
- Experts determined their agreement with the falls risk associated with each medication on a 5-point Likert scale where strongly agree = 5, agree = 4, neutral = 3, disagree = 2, strongly disagree =1
- A median value of 4 or 5 with the 25th percentile (P25) of ≥4 was required for inclusion in the tool; only medications with at least 75% of respondents agreeing or strongly agreeing were retained in the next round. Proposed criteria with a median value of 4 or 5 and a P25 of <4 were modified as per panelists' suggestions and included in the next Delphi round; those with a median value of ≤3 were excluded.

Acknowledgements

The authors would like to thank the Delphi panel of experts for their invaluable contribution; without them, this research would not have been possible.

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Results

- Consensus was reached for 19 medications/medication classes to be included in the final version of the MRF tool (Table 1) and to reject eight medications/medication classes (e.g. dipyridamole, laxative and dementia medications). Consensus was not reached regarding eight medications (e.g. dopaminergic, third-generation antiepileptics, selective alpha-blockers and prochlorperazine).
- Eight medications were accepted in Round 1, eight medications in Round 2 and three medications in Round 3.

Table 1: The Medication-Related Fall (MRF) Screening and Scoring tool

High-Risk Drug Classes Risk Score = 3 Medications that may commonly cause or contribute to falling risk on their own or in combination. Evidence from observational studies and clinical experience (i.e., seeing patients on these medications with frequent falls) leads to consider these medications "high risk"	Moderate-Risk Drug Classes Risk Score = 2 Medication that may cause falls especially in combination. Different studies and systematic reviews have reported conflicting results regarding the association between the use of moderate-risk medications and the risk of falling. However, falls-related side effects are possible and using these medications in a combination may increase risk of falling.	Low-Risk Medication Classes Risk score=1 Medications that possibly cause falls, particularly in combination. Published evidence of a direct link between the use of these medications and an increase in falls risk is lacking; a specific medical condition may mean that patient is more likely to fall.
Antimuscarinics/anticholinergics	Angiotensin-converting enzyme inhibitors (ACEIs)/Angiotensin receptor antagonists (ARBs)	Non-dihydropyridines calcium channel blockers (CCBs) (e.g. verapamil, diltiazem)
Antipsychotics including atypicals	Antiarrhythmics: digoxin, amiodarone, flecainide	
Benzodiazepines and hypnotics	Beta-blockers	
Centrally acting antihypertensives (e.g. clonidine, methyldopa)	Dihydropyridine calcium channel blockers (CCBs) (e.g. amlodipine, felodipine, nifedipine, lercanidipine, lacidipine, nimodipine)	
Direct arterial vasodilators (e.g. hydralazine)	Muscle Relaxants (e.g., baclofen, dantrolene, methocarbamol, orphenadrine, tizanidine)	
First generation antiepileptics: carbamazepine, phenytoin and phenobarbitone	Opioid analgesics	
Loop diuretics (e.g. furosemide, bumetanide)	Second generation antiepileptics (e.g., sodium valproate, gabapentin, pregabalin	
Non-selective alpha-blockers (e.g. doxazosin, prazosin)		
Sedating antihistamines (e.g. promethazine, chlorphenamine)	Thiazide diuretics (e.g. bendroflumethiazide, chlorthalidone, metolazone)	
Sedating depressants (tricyclics and related medications)		

Conclusions

- The MRF tool is simple and has the potential to be integrated into person-centred medicines optimisation to reduce falls risk and negative fall-related outcomes.
- The score from the MRF tool can be used as a clinical parameter to evaluate prescribing appropriateness as well as prescribing decisions. Furthermore, It can be used to identify patients for referral to the Falls Pharmacist.
- Future investigation into the predictive validity and reliability of the MRF tool must be conducted to further validate this tool.