



## Commentary

# Commentary on: Are multimorbidity patterns associated with fear of falling in community-dwelling older adults?

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*This is a commentary on the published article: Canever JB, de Souza Moreira B, Danielewicz AL, de Avelar NCP. Are multimorbidity patterns associated with fear of falling in community-dwelling older adults? BMC Geriatr 2022;22(1):192.<sup>1</sup>*

## Introduction – Developing a Fear of Falling

Falls, generally defined as ‘an event that leads to a person coming to rest on the ground or other lower level’<sup>2</sup>, are associated with significant morbidity and mortality in older patients<sup>2,3</sup> alongside threatening the independence of older people<sup>4</sup>. Indeed, falls and falls related injuries such as neck of femur fractures are leading problems in residential aged care facilities<sup>5</sup> and can lead to significant patient and carer anxiety about future falls<sup>6</sup>. This anxiety about future falls can lead to a fear of falling (FOF), defined as an exacerbated concern about falling during routine activities of daily living<sup>7</sup>. FOF can arise for several reasons, with recent qualitative work demonstrating that a fall may lead to an individual developing an increased awareness of their physical and/or environmental vulnerability with a sense of control around falls being an important factor to consider<sup>8</sup>. Indeed, maladaptive behaviour may develop in the event the fall is felt to be outside the individuals’ control or protective adaptations in the event the fall is felt to be within the individuals’ control<sup>8</sup>. Furthermore, a 2023 review of qualitative studies extended these findings identifying that apprehension due to unpredictable nature of falls and unease regarding vulnerability following falls are important attributes commonly preceding FOF development<sup>9</sup>. Other attributes included high vigilance-related to the environment, and concern about potential harm after falls<sup>9</sup>.

In the Korean Longitudinal Study of Aging, FOF has been associated with higher rates of functional decline, even more so than activity avoidance alone which is felt to increase functional decline through deconditioning<sup>10</sup>. Other work has reported that FOF leads to significant modification of patient activities which may impact quality of life negatively<sup>10-14</sup>. FOF has been associated with a variety of risk factors including demographic variables (physical and mental health related alongside functional measures) and environmental variables<sup>15,16</sup>.

## Fear of Falling, Multimorbidity & Terminology Use

Recently, there has been increasing work reporting a relationship between multimorbidity and FOF<sup>15-17</sup>, with multimorbidity more broadly associated with other important parameters relevant to FOF and falls such as frailty<sup>18</sup>, cognitive impairment<sup>19-22</sup> and hospitalization<sup>23</sup>. Relating this to the literature on FOF development, patients with multimorbidity may be at particular risk of developing FOF<sup>8,9</sup>. This is because of increased risk of recognition of vulnerability (disease and medication factors) alongside a greater risk of the harm associated with falls. It should be noted that not all individuals who develop FOF have entirely maladaptive mitigation strategies<sup>24</sup>. Indeed, FOF may stimulate sensible engagement with adaptations for the home environment, attendance at physiotherapy clinics or attend their physician for polypharmacy review. However, it should be recognised that fall reduction programmes should integrate FOF into their overall therapeutic approach as perceived and physiological risk of falls are both associated with increased risk of falls<sup>25</sup>.

Multimorbidity, defined as the co-existence of two or more chronic conditions within an individual<sup>26,27</sup>, is now the norm in ageing populations<sup>28</sup>. Multimorbidity, despite work looking at disease clustering, is generally accepted to be a heterogenous condition<sup>29,30</sup> and as such interventions to address the impact of multimorbidity on patients and healthcare systems are likely to require to

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be multi-dimensional. For example, focusing upon medical interventions and treatments associated with a certain condition to reduce hospital readmissions (such as heart failure) without broader social support or consideration of integration with community teams is unlikely to succeed. This is due to most patients who are readmitted within 30-days readmitted for a different reason, and treatment for one condition (e.g. diuresis for heart failure) may lead to exacerbations of other conditions (e.g. dehydration and acute kidney injury)<sup>31</sup>. Similarly, given the heterogeneity of reasons for people developing FOF rather than the historic term of 'post-fall syndrome'<sup>14</sup>, effective interventions for FOF were typically multi-component programs including exercise (primarily balance and strength training or tai chi) and cognitive behavioral therapy<sup>32,33</sup>.

It should be noted that although FOF continues to be well used in the wider literature, there are moved to move towards the terminology 'concerns about falling'<sup>34</sup>. There are negative connotations around the word fear, and the Falls Efficacy Scale International explicitly asks patients about concerns about falls rather than fear<sup>34</sup>. Similarly, within the multimorbidity research field there has been reflection on the utility and patient perception of the terminology despite multimorbidity being extensively used in published work<sup>35,36</sup>. Indeed, a taskforce on multiple long-term conditions led by the Richmond Group of Charities reported that patients did not feel that the term multimorbidity was acceptable to describe their condition and lived experiences<sup>37</sup>. A recent BMJ opinion paper identified a move towards the term multiple long-term conditions, which is advocated by the National Institute for Health and Care Research strategic framework<sup>34</sup>. Khunti et al. reported that the term multiple long-term conditions is perceived as less fatalistic for patients, and has more clinical relevance<sup>34</sup>. Negotiated use of medical terminology, balancing patient and clinicians experience and understanding of terms, is important<sup>38</sup> and there have been recent examples of such debate within the context of frailty<sup>39</sup> and geriatric medicine more broadly<sup>40</sup>.

This commentary aims to discuss how evaluating multimorbidity patterns to mitigate impact of clinical outcomes may be achieved, using a recent paper published in BMC Geriatrics on the relationship between FOF and different multimorbidity patterns based upon a community-dwelling population of older adults in Brazil<sup>40</sup>.

Why is multimorbidity particularly of relevance in relation to FOF? With multimorbidity increasing in prevalence and incidence and affecting older patients most commonly<sup>28</sup>, evaluating the relationships between multimorbidity and important 'geriatric giants' of impairment of intellect (cerebral dysfunction), incontinence, immobility and instability (falls) is clinically important. To this end, Canever and colleagues recently published work discussing the relationship between FOF and different multimorbidity patterns based upon a community-dwelling population of older adults in Brazil which has provided some pertinent

insights into this developing area<sup>1</sup>. No studies to date have looked at varying multimorbidity patterns and their impact upon FOF, and therefore the paper presents a timely analysis.

Canever et al performed a cross-sectional study of 308 older adults (defined as 60 years or older), excluding patients who were bedridden, dependent or unable to answer the researchers' questions, to try and have patients who reflected mobile community-dwelling adults. The authors used the well validated 16-item and 7-item Falls Efficacy Scale International (FES-I)<sup>41</sup>, which was modified for use in a Brazilian population, to evaluate concerns about suffering falls. The authors categorized patients with the self-reported presence of two or more conditions into three patterns of multimorbidity, namely cardiopulmonary (including chronic bronchitis, asthma, cardiac disease and tuberculosis), musculoskeletal (arthritis, rheumatism, chronic back problems and osteoporosis) and vascular-metabolic (essential hypertension, diabetes mellitus, stroke, cancer, chronic renal failure). Logistic regression analysis was adjusted for sex, age-group, and cognitive impairment. 41% of patients had one multimorbidity pattern, with 14.3% having two or three multimorbidity patterns. The authors reported odds ratios (and 95% confidence – intervals) of 3.49 [1.13-10.78], 2.03 [1.13-3.64] and 2.14 [1.2 – 3.82] for cardiopulmonary, musculoskeletal and vascular-metabolic patterns respectively between multimorbidity patterns and having a FOF. Ratios increases to 4.84 [2.19 – 10.68] for patients with 2 or 3 multimorbidity patterns. These findings make clinical sense, with patients with diabetes<sup>42</sup>, cardiac disease<sup>43</sup>, respiratory disease<sup>44</sup>, musculoskeletal<sup>45</sup> pathology all associated with higher rates of falls. Furthermore, the FISTAC study reported significantly higher FOF for patients with diagnose frailty (by phenotype criteria) compared to older patients without frailty<sup>46</sup>.

These findings have several important implications. Firstly, the relationship between different multimorbidity patterns and FOF may be helpful when considering mitigation strategies for FOF. The authors reported a 3.5 times higher likelihood of having FOF with cardiorespiratory multimorbidity pattern, and with many patients with cardiac or respiratory disease undergoing rehabilitation, such programmes may be adapted to implement components known to improve FOF<sup>31,32</sup>. Extending this more broadly, patients with common chronic diseases (cardiovascular disease, asthma, chronic obstructive respiratory disease (COPD) diabetes, chronic kidney disease) could be asked about FOF and falls as part of their chronic disease reviews, often delivered within primary care. This may identify issues early, particularly in patients without a history of falls where FOF often isn't considered by clinicians. Active inquiry into FOF may start the process of medical review and intervention at an earlier juncture. Recent systematic reviews suggest that multifactorial and exercise interventions (including holistic exercise and body awareness) are associated with fall-related benefits<sup>47</sup> and reduced FOF<sup>48,49</sup>, with exercise being associated with

consistent benefit across multiple fall-related outcomes<sup>47-49</sup>. Integration of exercise programmes for FOF and other chronic long-term conditions (cardiorespiratory disease) may have the ability to impacting multiple clinically relevant outcomes and reduced fragmentation of care often experienced by patients with multimorbidity<sup>50</sup>.

Secondly, the study provides useful evidence that the risk of development of important geriatric syndromes may differ by patterns of multimorbidity, and understanding these relationships will be a priority for prevention and assuagement of some of the morbidity associated these conditions. This is particularly important as these syndromes are generally multifactorial in their nature, and similarly to multimorbidity and frailty there is no panacea for their mitigation. Further research identifying clusters of multimorbidity associated with a greater FOF remains pertinent as the best approaches to mitigate FOF may include screening for FOF and mental health disorders (such as anxiety / depression)<sup>51</sup>, and early referral to FOF programmes (exercise and psychological)<sup>52</sup>. This research will enable the focusing of resources to patients with most to benefit from input. Within the authors practice, identification of patients over the age of 65 who have attended the GP for acute presentations on four occasions within 3 months, those readmitted to hospital within 30 or 180-days of discharge and poorly controlled chronic disease management (identified through chronic disease clinics within the practice) are called for a primary care comprehensive geriatric assessment (which includes FOF screening).

Finally, this work extends broader work looking at understanding patterns and clusters of conditions of multimorbidity alongside their impact on important clinical areas. Zemedikun and colleagues, using UK Biobank data, reported the presence of three different clusters of physical health diseases [group 1: myocardial infarction and angina; group 2: 26 conditions centering on diabetes; group 3: large number of associations centering around asthma, depression and cancer] and reported that conditions such as hypertension, diabetes and unipolar depression are central to the development of multimorbidity patterns<sup>53</sup>. More broadly, there has been interesting work on English and Welsh National Health Service data-sets which has developed an understanding of the chronological development of multimorbidity of time<sup>54,55</sup>. Such work, which reports the likely age of the development of important chronic diseases over time and the order of which conditions arise (temporal disease clustering), may provide an approach to target interventions at the right people at the right time<sup>54,55</sup>. Clustering and the order of the cluster sequence is important, as rates of morbidity may vary significantly<sup>54</sup>. To support mitigation of FOF, evaluating different multimorbidity patterns and their relationship with FOF is pertinent and of clinical use. Identification that patients prescribed several psychotropic medications, diagnosed with Parkinsons disease and who use an assistive device are

high risk of FOF and falls is not practice changing. However, identification of a variety of high yield groups (particularly where associations may be less clear) may support digital approaches to targeting patients most at risk of FOF and falls in a similar way to the electronic-frailty index. This style of approach has been shown to be effective for addressing primary care polypharmacy and adverse events associated with prescribing, with current practice often being that GPs perform undifferentiated polypharmacy reviews for large volumes of patients on 5 or more medications<sup>56</sup>. Simply being on five medications does not necessarily make a patient challenging to deliver care to or place them at high risk of drug interactions. Indeed, identification of types of polypharmacy most associated with harm in a randomized control trial (RCT) in 2016 reported that direct feedback on high-risk prescribing safety data to GPs was associated with a reduction in particularly high-risk prescribing<sup>56</sup>.

The study has several limitations. Firstly, the sample size is relatively small, with over 50% of the patients being under the age of 70 meaning that generalizability of the results may be limited, in particular to older age groups where FOF may be more of a concern. The prevalence of the cardiopulmonary multimorbidity pattern of 6.5% is somewhat lower than reported in other studies<sup>57</sup>, but this may represent the lower age of the study population alongside demographic differences with the Brazilian population<sup>32</sup>. Patients with cardiac disease are particularly affected by multimorbidity, often with associated congruent conditions, with 83% of patients with heart failure having 3 or more diagnoses<sup>58</sup>. Secondly, there are limitations with using self-reporting of patients' conditions, in particular for older adults, which may have impacted the prevalence of the multimorbidity patterns<sup>59,60</sup>. Finally, mental health disorders were not explored in the study, with the presence of anxiety and depression known to be associated with a FOF<sup>61</sup>. The authors did use the mini-mental state examination (MMSE) as a measure of cognitive dysfunction as an adjustment variable, but exploring the relationship of FOF and indeed falls with psychiatric diagnoses remains important to drive forward understanding of this area. This is particularly important with physical-mental health multimorbidity associated with particularly poor health outcomes<sup>62</sup>. Future research in this area may wish to broaden the data collected on multimorbidity, possible using administrative data. This would fit well with recent reviews calling for standardized data collection for multimorbidity research (such as co-existing chronic conditions; presence of functional deficits/disabilities; presence of frailty; and other states of poor health and health related behaviors)<sup>29,63</sup>. Such additional analyses may help explain why almost 30% of the cohort had a high FOF without any pattern of multimorbidity. Despite these limitations, the paper starts the process of thinking about relating multimorbidity patterns to important geriatric giants of clinical practice with future research interrogating these relationships in more detail.

## Where now?

Multimorbidity research in many ways is at an earlier stage, with clear recommendations for effective interventions for this patient group some way off due to the limited number of RCTs<sup>64</sup>. Indeed, a systematic review of multimorbidity interventions in 2021 reported that currently there was no or little difference in clinical outcomes based on current published trial, although this may change with the inclusion of ongoing large multimorbidity RCTs<sup>64</sup>. However, there were improvements in mental health outcomes, patient-related health behaviors and outcomes alongside provider/ clinician behavior in relation to prescribing and quality of care<sup>64</sup>.

The heterogeneity of multimorbidity can be overwhelming for policy-makers and clinicians, and indeed may make the term unhelpful in the clinic. For this reason, isolating the relationship of certain patterns of multimorbidity upon importance clinical measures is an important avenue to assist clinicians and health systems to improve the clinical care of this patient group. Evaluating the relationships between certain multimorbidity patterns and FOF, may support targeted identification of those at higher risk who would benefit from interventions. This will be an area of future research endeavors.

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