Reviewer's report

Title: Development and Validation of a Questionnaire for Analyzing Real-life Falls in Long-term Care Captured on Video

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Reviewer: clemens C becker

Reviewer's report:

The submitted article is relevant and adds information to a recent publication in the Lancet. In this article the authors report a new approach of video footage analysis in long-term care. The submitted article describes the video rater process in more detail and presents data on reliability, retest and inter-rater reliability in particular. The paper at this stage has several shortcomings and should be revised.

General remark and wording: the authors make very general comments on the causality of falls and interventions that might be designed and tested based upon their findings and material. It should be clear from the abstract that this material is limited to certain situations and sites in long-term care and by no means represents the full spectrum of fall situation of older persons. The review will mark some of these statements. It is clear that for most of the falls there was no or little clinical information on the observed individuals.

The term cause of a fall (causality) is misleading as the intrinsic component can only be guessed at best.

The authors have the privilege to have access to this material. It is also clear that most countries will not allow similar studies or routines in long-term care because of the current legislation and other restrictions. This means that the findings and the hypothesis derived from the material will be hard or impossible to test under different circumstances. This does not reduce the value of the material but it highlights that the information and approach should be phrased with modesty.

Introduction: this section is well written and balanced. There is only one question. The author cite the sideway hip fracture paper (ref. 26). That seems to be an assumption by the original authors. Why could this not be a backward fall with turning during the fall to the side?

The other references are adequate.

Methods:

The presented paper excludes the resting and recovery phase of the fall, why?

The paper (and the Lancet paper) do not report the consequences of the falls, this limits the findings.

Methods

Why did the authors analyze 15 falls? What was the rationale to choose 15 and
not more (power analysis etc.)? The author should list the selected falls according to their classification. With such a low number certain fall types might have been missed or only 1-2 examples might have been analyzed. Please, list situations and selection bias.

Results
Positive findings in the process:
The term cause of the fall and activity at the time of the fall are misleading. Although this is quite often used a fall is the interaction between the person, the environment and the exposure of a person in a given environment. The term activity is also misleading. A walking activity is most of the time driving by a goal such as walking to a dining hall. Different walking or transfer activities can have very different circumstances.

These contextual information are likely to be correctly recorded in a post fall interview (e.g. walking to, or during a risk factor assessment prior to the fall).

Please specify if the findings on fall direction, stepping responses and impact to specific body sites where also possible with the cameras with a low frame rate (e.g. 5/min)? It is not clear how the frame rate and the camera position influenced the rater process.

For the less positive agreement it is again likely that some of the information can be extracted from reports such as footwear. For the aspects that cannot be captured from the reports such as contribution of clutter, reach-to-grasp responses and perceived site of injury risk please again comment on sampling rates and camera positions.

The authors mentions that definitions and examples for each category were provided in a comprehensive instruction manual. Is this accessible. The training process can only be poorly be judged if this not the case.

The phenotypic causes: “trip/ stumble”, “slip,” “incorrect transfer/shift of body weight,” “collapse/loss of consciousness” and “loss of support with external object” and hit and bump should be discussed in a consensus process. It is likely that this is not a full list or derived from the camera placement perspective. A fall on a staircase, for instance, would not fit into this category.

The activity list is not complete. Lying, for instance is missing, but was not documented with the camera positions. List: walking, rising up and lowering, seated and standing.

The list of protective responses such as stepping, grasping, and feet-in-place swaying or upper limb “windmilling” is interesting. Again this should be discussed in consensus process.

No reviewer comments on fall impact: forward, backward, or sideways.

Occurrence of contact to key body sites (head, pelvis, torso, hand/wrist, elbow/forearm, knee, and shoulder. It is likely that raters observed multiple
impacts.
How consistent were the findings of multiple vs. single impact?

Discussion
The wording and the structure of discussion section is superior to the abstract and the wording of some other sections. Most limitations are mentioned. This could lead the rephrasing of the abstract.

References
Adequate

Tables
Reasonable

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
No conflict of interest