Author’s response to reviews

Title: Prevalence and overlap of sarcopenia, frailty, cachexia and malnutrition in older medical inpatients

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Point by point response to reviewers’ comments

(Line numbers refer to the revised manuscript.)

REQUESTED REVISIONS:

The authors need to provide a justification for their choice of screening tools for each of the syndromes chosen.

As for all syndromes several definitions exist, we decided to use well established consensus definitions which are widely used in research in order to have a good basis to compare our results to other study results. This aspect was added to the methods section (Page7, L10/11) and the discussion (Page 11, L35). Furthermore, we inserted short paragraphs in the discussion section to introduce the discussion of the each specific syndrome in order to better explain the choice of the respective definitions.

1. Sarcopenia: For the assessment of sarcopenia, the EWGSOP definition [10] was applied because it combines measures of muscle mass and function, is related to poor clinical outcome,
is well established, and has previously been used in several studies in older hospitalized patients (Page 11, L36-40).

2. Frailty: To assess frailty the Fried definition [11] was chosen, as it is the most widely used frailty definition in medical research, focused mainly on the physical phenotype of frailty, which is of interest here, and relatively easy to assess (Page 12, L7-11).

3. Cachexia: For our study we decided to operationalize cachexia according to Evans et al. [12] including biochemical measures in contrast to other definitions (Page 12, L31-34).

4. Malnutrition: Malnutrition was assessed according to the ESPEN definition [13], the first consensus definition with age-specific cut off values for a low BMI. Since the ESPEN criteria were published in 2015, it was used in a number of studies [5, 43-45] providing a good basis for comparison of our own results (Page 13, L11-16).

They also need to discuss the issues related to a relatively low compliance in more detail.

Thank you for raising this point. Unfortunately, we were not allowed to collect data on characteristics of patients unwilling to participate in our study for ethical reasons. Therefore a comparison of this group with the study sample was not possible. We added the following sentences to the limitations section of the discussion to address the potential bias because of this issue: “Furthermore, 13 % of the initially admitted patients had to be excluded due to their unwillingness to participate. As these patients did not consent to any data collection, it is unfortunately not possible to describe potential differences between these patients and the study sample. It may be assumed that a selective participation of less severely impaired patients also contributed to the high physical and mental performance of the study sample.” (Page 14 L46ff).

ADDITIONAL REQUESTS/SUGGESTIONS:

In the methods section, it would be better to start with the definition of each syndrome, and then include the tests performed for each syndrome, rather than begin with the "Assessment of components of tissue loss syndromes" followed by the "Definitions of tissue loss syndromes" section.
For instance, if sarcopenia was the first syndrome mentioned, it would make more sense to describe the definition used and the methods used to test each component. When syndromes have the same component, such as handgrip strength, the subsequent syndromes (frailty and cachexia) would then refer to the test used for sarcopenia.

Thank you for this suggestion. We changed the order of the paragraphs “Definitions of tissue loss syndromes” and “Assessment of components of tissue loss syndromes” in order to proceed from the more general topic (syndromes) to the details (components). For reasons of clarity, however, we decided to maintain the separate presentation of the syndromes and their components. (Pages 6-8). The order of references was adapted accordingly.

It might also be worthwhile presenting the results of pre-frailty and the three levels of sarcopenia (pre-sarcopenia, sarcopenia, and severe sarcopenia) of the diagnostic tools used.

We added the proportions of pre-frail participants and those with severe sarcopenia and pre-sarcopenia to the results section (Page 9, L48-50).

We further updated references 5, 42-45 and 49 which were in press at the time of manuscript submission.