Reviewer’s report

Title: Associations between skin barrier characteristics, skin conditions and health of aged nursing home residents: a multi-center prevalence and correlational study

Version: 0 Date: 16 Aug 2017

Reviewer: Shinji Iizaka

Reviewer's report:

The manuscript has been revised well. The purposes, methods and results has been well described. I have several additional concerns especially about the discussion section. 1) Because this is a descriptive study, please explain the detail characteristics about prevalence of pressure ulcers, skin tears and IAD. The authors just described that "Most PUs were observed at the sacral region (4%) followed by the heels (2.2%) in residents with severe care dependency (P12 L185-186)". Please clarify the percentage of all sites (100% in total). Also, the sites of skin tears (arm, leg or others) should be described. 2) The authors mentioned that "The low number of associations being detected between biophysical measurements and clinical outcomes in aged long-term care residents indicate that these phenomena seem to be independent. Empirical evidence suggests, that there are associations between dry skin and PUs [32]. However, this finding could not be reproduced on this sample (P18 L273-276)." The reason was not well discussed. Please consider the clinical validity of skin measurements and analyses in this study. Most pressure ulcers were developed at the sacral region but skin parameters were measured on arm or leg. In general, the region of IAD shows high skin hydration (i.e., maceration). It is necessary to compare two variables at the same site in dermatology. 3) "Evidence further suggests that nursing home residents being more care independent are more likely to develop skin tears on the lower legs, whereas residents being more care dependent showed a higher occurrence of skin tears at the arms [10]. This finding could not be supported with our results (P18 L277-279)." Please discuss the reason. 4) The results of linear regressions (Table 4&5) were not well understood. A variable was included as dependent variable in one table, but as independent variable in other tables. For example, was SCH (leg) an independent or a dependent variable for ODS? Why were skin tears and pressure ulcers independent variable for SCH or TEWL? What was the hypothesis of these analyses? How can we interpret the results? Because the purposes are "to investigate possible associations between functional, skin barrier and cutaneous variables in aged long-term care residents and to investigate the strength and directions of these associations", it is enough to show only Table 3. 5) The author concluded "Only few associations of demographic characteristics, skin barrier impairments and the occurrence of dry skin, PUs, skin tears and IAD have been detected limiting the diagnostic value of skin barrier parameters in this population. Overall, the measured skin barrier parameters seem to have limited diagnostic value for the reported skin conditions except xerosis cutis. Results indicate, that TEWL might be a limited predictor for skin health in this population." This conclusion was over-interpreted because this study was a cross-sectional and just a descriptive study. It was natural that arm TEWL was not associated with sacral pressure ulcers or IAD. Again, please consider the study design and the methods, then the generalizability of the results. Careful design, analyses and description are needed to verify poor diagnostic value.
Are the methods appropriate and well described?
If not, please specify what is required in your comments to the authors.

Yes

Does the work include the necessary controls?
If not, please specify which controls are required in your comments to the authors.

Unable to assess

Are the conclusions drawn adequately supported by the data shown?
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No

Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
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I am able to assess the statistics

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