Reviewer’s report

Title: Comparing performance of mothers using simplified mid-upper arm circumference (MUAC) classification devices with an improved MUAC insertion tape in Isiolo County, Kenya

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Reviewer: Joshua Pearce

Reviewer's report:

This is a good and interesting study topic - but there are several minor problems with the implementation of the study which need to be addressed before publication.

Results -- the core of this study is found in Table 2 - but I believe the explanation in the differences in the sensitivity column are an issue and need a much better explanation. Why were 4-6 % of the users of muac click bands not able to identify that the circumference of the arm of the child was under the 115mm? If designs 1,2, or 3 were appropriately sized and they clicked shut -- this would be a binary test. How are they so far off. The idea that mothers were afraid to pinch their children's arms if anything would have pushed this metric in the opposite direction if I understand the study correctly. If it can be explained by 'practice' --why wasn't the order of the use changed/randomized? or the measurements repeated?

- There are several technical aspects that were not clear from the methods: How were the prototypes manufactured? How many of each were there? What was the difference in their tolerances/repeatability? (e.g. was the reason for the discrepancy in the data because the prototype tolerances were wrong or because the users used them incorrectly?)

- In the description of figure 1 - 3d printing is mentioned - -if this is conventional FDM all of the 3 designs would not have printed properly (e.g. match the CAD) as shown because of overhangs and bridges unless support was printed as well. Were the actual bands used injection molded or milled? Please provide full details

- The lit review for this work also does not appear complete. There is considerably more articles discussing the efficacy of muac tapes than shown here. More importantly, click band literature does not appear. For example, why wasn't the first "click muac band" in google scholar used? https://doi.org/10.1017/S1368980017000726 and How did the 3 designs used here differ from that one in application?

- What was the standard deviation in the gold standard 3 measurement mean?
- Are the scripts in ref 21-22 available/accessible? No hyperlinks?

Lastly on Table 3-- it appears that the vast majority of the mothers preferred some form of click muac band while the clinical staff preferred tapes. Please discuss why there is a difference? Ability to quantify vs yes-no? experience with old way? or is something else going on?

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