Reviewer’s report

Title: Nocturnal finger skin temperature in menstrual cycle tracking: Ambulatory pilot study using a wearable Oura ring

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Reviewer: Helena Kopp Kallner

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Review

This paper is rather well written and describes the use of a ring to measure basal body temperature throughout the menstrual cycle. Exactly what this will be used for is not entirely obvious but it seems the authors are more interested in health applications that contraception and fertility. The English need to be checked but not to a large extent.

General comments

I miss a discussion on improvements. How could the method be improved?

Is it really necessary to open the app and download the temperature? Why is this not done automatically?

With longer registration- would it not be better with a "learning algorithm" which improves with longer registration?

I also miss a discussion on why women participated? Were they offered anything to participate or did they do it "just for fun”.

And finally I miss a discussion on the performance of prediction in relation to existing published apps such as the Dot app and Natural Cycles. Even though they are menstruations trackers and contraceptive devices- it is still interesting with a discussion why anyone would choose to use this model with the ring instead of the existing ones

Lastly this is quite a mathematical paper and I would let someone familiar with correlation statistics and algorithms review the paper.
Specific comments

Line 58 would state the most common premenstrual symptoms here. Such as irritability, anger or depressed mood.

Line 61 vaginal flow is awkward. Vaginal secretion?

Line 63 “follow ovulation for”. Rewrite- eg The rise in BBT occurs at 1-3 days post ovulation.

Line 74 strange sentence

Line 78-83 just to be sure I understand. The distal skin temperature rises as CBT decreases?

line 231 Please justify using the window lengths used. They seem very wide. Would anyone accept +/- 4 days? Especially considering the survival of sperm of 6 days. If it were to be used for contraception eg or for identifying the fertile window.

Line 298 generally good is a bit too subjective. What exactly is meant by good?

Line 313-321 would leave out the algorithms that did not perform well.

Line 343 don't understand. Is this not what has been done. But retrospectively with the dates already known beforehand. Why would this differ from what has been done?

Line 351 it seems that these areas for use are not the most obvious ones and they are hardly mentioned in the manuscript at all.

Line 328. Interesting that you call this limitation- I would call it a strength that it performed so well under these more "typical use" conditions.

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.

Yes

Are the conclusions drawn adequately supported by the data shown?
If not, please explain in your comments to the authors.

Yes
Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

I recommend additional statistical review

Quality of written English
Please indicate the quality of language in the manuscript:

Needs some language corrections before being published

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I am a consultant for Natural Cycles - an app used for contraception.

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