

Reviewer's report

Title: Beverage consumption habits "24/7" among British adults: association with total water intake, energy intake and physical activity.

Version: 1 **Date:** 9 May 2012

Reviewer: Jodi Stookey

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MAJOR COMMENTS

This study includes valuable data on water intake that should definitely be reported. The question is, however, what to fit in one paper. The analysis needs more structure and control. The discussion needs a tighter focus on the data presented.

Introduction:

1. It is not clear what the main aim is. What should the reader expect to look for in the following paragraphs? Variables like time of day, which appear in the results, are not set up in the introduction.

Maybe:

- Explain the importance of describing UK-specific water intake relative to reference value
- Describe the available references from different countries. Explain why it might be iffy to extrapolate to the UK
- What new information is this paper contributing given the other paper by Ng?
- Give a rationale (like an outline) for the sections that follow to set up the paper.

2. Right now, the results section has the following parts...

- 1) Total water intake ~ beverage consumption
- 2) Variety of beverages
- 3) Influence of day of the week
- 4) Beverage consumption over 24hrs
- 5) Combined classification for low vs high waterintake
- 6) Energy from beverages
- 7) Physical activity

Each topic is rich enough to have its own paper. The many topics together are distracting. It's not clear why the paper is looking at all these variables at the same time.

3. Is the idea is to check for/confirm/refute associations between water intake

and each of these topics for the UK? If yes, then the introduction should explicitly state and reference each observation to be checked. E.g...

- 1) Do X % of the UK adults have low water intake like X country with X (references for X country)? Why/why not should X% be expected?
- 2) Does total water intake vary with beverage variety in the UK like it does in X country (refs..)etc.
- 3) Does total water .. day of the week etc.

Also -- if yes, then some discussion about why associations that hold in other countries do/don't hold in the UK (what other confounding/modifying variables might be involved?)

4. If the idea is to make statements about effects of beverage intake on any outcome, more work is needed to control for all potential covariates, including determinants of water requirements in multivariable models. It is not enough to only control for age and energy underreporting. Age, sex, activity, body size, health status, intake of energy, protein, caffeine, solute..., ambient temperature and humidity (season)...Without more control/accounting for the study conditions, the discussion should avoid critical statements about the "assumptions" of other studies.

5. To save space, the text on health issues in the introduction could be dropped. Health outcomes are not in the current study dataset – making it beyond the scope of the paper.

Methods

6. More information is needed about the sample. Were no inclusion/exclusion criteria applied to restrict the study sample? Why stratify by sex (rationale needed) and not by other variables? What were the characteristics of the study sample in terms of determinants of water requirements. Was there an IRB process?

7. The data are 10 years old. The fact that these data may not reflect what is happening now needs to be clear in the discussion. What is the value of using old data (I think there is one, so am just asking that it be added!)

8. How representative is this sample if 77% of the 61% completed the diet records? The 7day weighed record is so burdensome that people change what they're eating to make life simpler. Also, not everyone may be willing to do a 7day weighed record. So the sample may reflect only the willing people.

9. VERY IMPORTANT TO CLARIFY: It seems that water from each type of beverage was not calculated - but rather estimated using the amount of beverages (milk, juice, soft drinks...) as proxy. The methods section and tables give this impression. Is this correct? Was the water content of each beverage not available to be aggregated? If you are working with grams of beverages, like the grams of juice consumed (as opposed to only the water from juices), more explanation/justification about why this is ok is needed.

Results

10. The amount of figures and tables gives the sense that this paper is not distilled to its main findings. Is there a way to reduce to the key data? Would it work to show the 7-day means by time in two figures, one for each sex (or other key stratification variable), instead of 14? (collapse down to show only the significant/notable variation).

Again, it's not clear what we are meant to look for in the 14 figures, because the analysis on variation by time is not at all set up in the introduction.

11. Table 1: Why present total beverage consumption and water from beverages?

12. What does it mean that added sugar was excluded? Excluded from what part(s) of the analysis? Included in total energy?

13. It is not necessary to describe variables that are not used (e.g. blood pressure, blood sample..)

14. Has the physical activity variable been validated (reference)?

15. This paper does not have any data on hydration status. Avoid any statements and conclusions about hydration – stay with statements about water intake -- relative to reference ok, if the data are presented relative to reference levels.

16. This is not a study about trends. It's premature to talk about targeting of messages when this paper is only just identifying issues. At this point, we don't even know if there's a group with low water intake, much less if having low water intake needs to be corrected (if there's low water intake, next would be to find out if they are suboptimally hydrated). Remove discussion of interventions to increase variety of beverages to improve public health -- The data and paper do not focus on the relationships between beverage variety and outcomes (would need to set this up in the intro and follow theme through the methods, -- including appropriate controls--, results, tables, figures)

MINOR COMMENTS

17. The figures need more formatting.

18. The labels could be more specific, as in: 7d Mean 24hr total water

19. The reference for Ng et al. is missing.

20. Line 401: The meaning of this sentence is not clear Suggest rewording.

What assumptions relating to the major sources of liquid calories ... are meant?

The data and all of these topics are interesting and important, so I look forward to your end-product(S!):

Low relative to recommendations

What sources contribute to water

Within-between person variation in total water intake and sources

If beverages/sources lead to excess energy intake

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

In the past five years I have received funding from companies that sell beverages (all kinds of beverages including water).