Reviewer’s report

Title: Normative prosthodontic care need: does it impact the daily life of young Saudis with high level of oral diseases? a cross sectional study

Version: 0 Date: 15 Jun 2017

Reviewer: Erin Masterson

Reviewer’s report:

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I think this topic is important and likely relevant to other populations with a high prevalence of oral disease in early adulthood. I appreciate the careful approach taken by the authors, specifically inclusion of a conceptual framework, but think the framework needs further development and more critical evaluation of the role of covariates in each analysis. These considerations may result in needing to re-analyze the data. The definition of the primary variable, "need for prosthetic care", should be articulated clearly and early on in the manuscript and incorporation of other oral health conditions should be cautiously incorporated into analyses given the relationship between caries or perio with tooth loss.

Abstract

- define "need for prosthetic care" and "normative" -use "normative" consistently if it has implications on the definition of prosthetic care; otherwise delete

- "young" in Background, then "adult" in Methods and Results sections - clarify (perhaps "young adults" or explicitly state age range of study sample)

- Background suggests focus is on "need for prosthetic care" but Results report other oral health outcomes --> revise Methods to reflect approach

- include exposures assessed and specific outcomes (oral health, and 6 daily life aspects);

- "impact on daily life" = "quality of life"?

Intro

- P4L51: specify definition of "prosthetic care" in first sentence
- P4L52-53: seems obvious, but should include access to care/ability to pay/time to seek care as important factors in obtaining treatment

Methods

- P5L88: target ___(sample size?)___ ..... 
- upper age limit inclusion criteria to ensure young adult pop?
- P6L100: suggest "demographic variables"
- P6L100: suggest "sex" instead of "gender"
- P6L103: these are not risk factors for all oral diseases, consider re-phrasing to be more accurate
- P6L107: suggest "brushing habits"
- P6L109: suggest "sugar sweetened beverages"
- P6L110: suggest "topical fluoride" since ingested fluoride is not included in the description
- P6L114: suggest "if each of these problems" if this is accurate

- Describe clinical exam before Questionnaire since the "need for prosthetic care" is the focus of the study

- the definition of "need for prosthetic care" or "normative need for prosthetic care" is not included in the Materials and Methods section - the description (currently under Conceptual Framework P7L135-140) should be moved to the beginning of the paragraph that starts on P6L116 since this is the primary outcome of interest/focus of the study

- consider simplifying the definition of "need for prosthetic care" to simply stating criteria #1 from citation 16 (how were "ill fitting or not esthetically acceptable" assessed in order to exclude criteria #2 anyway?)

- Revise P6L116-124 so that, First, the primary outcome/condition of focus is defined ("need for prosthetic care", per prior bullet). Next, describe the exam that generated the two variables for determining "need for prosthetic care" (prosthetics and missing teeth). Third, note that additional oral health measures were included in the exam (decay and perio).

- move content in the Conceptual Framework section (P7L140-150) to Background and include citations for established associations/relationships between variables

- P7L142: suggest rephrasing sentence - "in turn" seems to suggest that these things result from caries whereas you mean to say the opposite
- P7L145: specify "Some of these factors"

- the Conceptual Framework section should address if/how covariates are related to the exposures and outcomes of primary interest (need for prosthetic care, impact on quality of life)

- P8L150: need citation for statement "known to increase as the number of lost teeth increases."

- P8L160: too much reliance on black box/computerized approach to selecting covariates in models and their roles in the relationships of interest, such as as confounders or for statistical precision (eg, P8L168: "The software suggest"). Additionally, distinction should be made between associations and established causal relationships. Daggity could be used and cited as a tool for developing the conceptual framework but the extensive description on P8L160-169 (and such a heavy reliance on its output) is not warranted

- Revise DAG: should have one direction as noted in Analysis subsection (PP8L156), suggest referencing the work of Judea Pearl when making these revisions. Specifically, suggest making arrows go from left to right or from top to bottom, show how the covariates are related to the outcomes (need for prosthetic care, quality of life)

- P9L174: adjust for age when "need for prosthetic care" is outcome (you state this association in your Intro/Background section)

- P9L174: "MSA set" - actual measures should be listed here

- P9L175-178: if there are multiple exposures considered, this should be reflected consistently throughout the manuscript; the Abstract and Intro suggest the interest is focused on how the need for prosthetic care influences quality of life. You could consider adding the influence of other oral conditions on quality of life as a sub-analysis. However, as you state on P8L148, you must also address the fact that the influence of oral diseases and need for prosthetics on quality of life are difficult to separate.

- P9L178: "MSA set" - actual measures should be listed here; explain why are the "number of teeth lost" adjusted for? Is age associated with quality of life (P10L219 indicates age is only related to feeling pain)? If not, why is it adjusted for? Same questions apply to SES. Adjusting for factors only associated with the exposure will bias your results.

- P9L180: statistics - address concern for multiple comparisons (6 outcomes by 3 exposures in the second analysis)

- P9L180: rephrase sentence on interpretation of statistical thresholds, rather than "set" perhaps state that p-values less than 0.05 were considered statistically significant

Results
- given nearly 20% of the study sample has incomplete data, the existing data should be evaluated for selection bias to the extent possible.

- given the motivation for this paper was that little evidence for prosthetic need is available in younger (adult) populations with high prevalence of dental decay, it is confusing why nearly 30% of the study sample is over 40 years of age. If age is an effect modifier or risk factors for need for prosthetic care, should the analysis be stratified by age or should the analysis be restricted to the age bracket of interest (younger adults)?

- P9L192-195: suggest new paragraph to describe the oral health outcomes of the study sample; it would help readers to directly connect the relationship between missing teeth and prosthetic appliances with "needed prosthetic care". In this analysis, "need for prosthetic care" is essentially having at least one missing tooth (that hasn't yet been addressed with prosthetics)

- P10L209-213: In your multivariate analysis, you have adjusted for causes of the tooth loss/exposure (which are also directly associated with quality of life/outcome) so you could expect that the relationship you observed between "need for prosthetic care" and quality of life would be attenuated. What is the question you want to answer? This should guide your analytic decisions: are you interested in the quality of life impact of the need for prosthetic care or on understanding how need for prosthetic care influences quality of life above and beyond the influence of oral disease?

- Figure 2 - I find this very difficult to interpret, would prefer to see descriptions of the quality of life measures in Table 1 and a Table 3 with regression results (and numeric 95% CIs) for the assessment of need for prosthetic care --> quality of life

Discussion

- address role of universal care coverage in findings, generalizeability to other populations

- include a more detailed description of how other studies measure "need for prosthetic care"

- for next steps in this area of work, or if this were longitudinal data, what statistical approaches may have been more appropriate?

Conclusions

- P14L313-314: suggest reconsidering whether need for prosthetic care (or "tooth loss without prosthetics") truly has no negative impact on quality of life based the reported results (see comment above on multivariate analysis for need for prosthetics --> quality of life analysis)

Throughout the manuscript:
- be careful with use of "effect" (implies causality) vs. "influence" or another term that does not imply causality when not not warranted throughout

- define what MSA means or eliminate acronym/terminology and just articulate the reason for including each covariate in the model

- be consistent in the research questions addressed (the evaluation of caries and periodontal care --> quality of life is not mentioned until the end of the Methods section)

- if the only exposures of interest in the first analysis (risk factors for need for prosthetic care) are untreated decay and need for periodontal care, consider stating "oral disease and need for prosthetic care" (instead of generally referring to "associated factors", such as is done in the Abstract) as the focus of the study throughout; Alternatively, incorporate evaluation of other factors, perhaps including demographic and oral health risk factors.

**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.

No

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