



Research Critique 3 Rubric and Example: Worth 20%

1. Identify the Research Goal	0.5
2. Identify the stated population of interest	0.5
3. Identify the Inclusion and Exclusion Criteria and the resulting experimental unit	1
4. Identify the operationalized population of interest and ask yourself, “Self, does this make sense?” Write down the results of your judgment call and whether it matches the stated population of interest. How will any conclusions drawn be influenced as a result?	1
5. Describe the sampling method used and classify it. Discuss the appropriateness/limitations of the sampling method used.	1
6. Identify the Response variable(s) and classify them	1
7. Evaluate the appropriateness of the Response variable(s).	1
8. Identify Factors and classify them as study or extraneous; qualitative or quantitative	1
9. Identify the study design and time perspective	1
10. Analyze the usefulness/completeness/clarity of the methods section. (Do you understand what was done in the study? Are there problems with it?)	1
11. Summarize and analyze the results including basic statistics. (How were the study findings reported? Were summary statistics reported appropriately and extraneous variables addressed and “controlled”? How clear was the reporting?)	1
12. Analyze the discussion. Was it in keeping with the reporting of the finding? Were positive and negative findings discussed? Was power discussed? Was it appropriate?	1
13. Summarize the author’s conclusion. What they think, not what you think.	1
14. Give your informed and reasoned opinion about the conclusion of the research. Would you recommend any changes in patient care or nursing practice as a result of this study?	1
15. Summarize the Research	1
Total	15%

Watando, A., Ebihara, S., Ebihara, T., Okazaki, T., Takahashi, H., Asada, M., & Sasaki, H. (2004). Daily oral care and cough reflex sensitivity in elderly nursing home patients. *Chest, 126*(4), 1066 – 1070.

1. **Research Goal:** To study the relationship between intensive oral care and cough reflex sensitivity in elderly patients.
2. **Stated Population of Interest:** all elderly adults
3. **Inclusion /Exclusion Criteria:**
 - a. **Inclusion:**
 - i. Patient at nursing home in Sendai, Japan, where the investigators were
 - ii. Physical and cognitive symptoms must be stable for 3 months
 - b. **Exclusion:**
 - i. Chronic pulmonary diseases such as COPD, bronchial asthma, pulmonary fibrosis, and chronic cough.
 - c. **Experimental Unit:** A stable patient in a Sendai nursing home who does not have a chronic respiratory disease
4. **Actual Population of Interest:** All stable patients in a Sendai nursing home who do not have a chronic respiratory disease

Impact:

The Not so good: Rather than all elderly patients, the operationalized population of interest only includes elderly patient who are in a nursing home and do not have any chronic respiratory illnesses, yet these are often the most likely to end up in a nursing home. It does not include any independent elderly persons, so the results are not generalizable to the larger elderly population. By only including patients in Sendai Japan, the researchers are mixing their operationalized population of interest and their sampling technique (Dr. Heyman thinks it is sloppy research practice). The resulting population of interest (and sample) may have regional bias and perhaps bias caused by the standard of care at the nursing home studied.

The okay: The stable patient criteria keeps the study from being skewed by patients who may have already been declining, but unfortunately keeps us from knowing if intensive oral hygiene is a good intervention for a patient whose condition is declining. The exclusion criteria makes sense in that patients who have chronic pulmonary diseases are more at risk for pneumonia and have altered cough reflex already, but again, we will not know whether intensive oral hygiene is a good intervention for these patients.

Conclusion: In the end, this study can only tell us whether intensive oral hygiene can increase cough sensitivity for stable patients who do not have any other pulmonary problems (those who need it the least).

5. **Sampling technique:** The actual sampling method used is not stated. It appears that the researchers studied every patient at the nursing home that met the inclusion/exclusion criteria and signed informed consent. (This is a special case, because the researchers combined their inclusion/exclusion with their sampling method. Generally speaking, although this technique is fairly common, it blurs the line between operationalization of the population of interest and the sampling technique. In reality, it's convenience sampling.) The implications for the conclusions are the same as listed above in number 4 (don't put this down unless your article does the exact same thing or you will lose points).
6. **Response variable:** Cough reflex sensitivity as measured by the log of the concentration of citric aerosol necessary to cause at least 5 coughs in one minute while breathing the aerosol; it is continuous.

- 7. Appropriateness of response variable:** No scientific rationale is given as to why the authors chose this particular measurement of cough sensitivity, but, the R.V seems very well defined and reproducible, but again, the authors do not report any measures of reproducibility. The authors cite several studies showing that cough sensitivity helps to reduce pneumonia; however, they do not or report how it was measured in those studies. To further evaluate the appropriateness of the R.V and how well the authors adhered to established research would require reading the authors' bibliography and/or doing additional review of literature. No points for RV selection.
- 8. Factors:** Study factors: intensive oral care: yes or no (qualitative)
Extraneous factors: age (quant), Serum substance P (quant), cognitive function (quant), ADLs (quant); gender (qual); dentures (qual)
- 9. Study type:** Prospective study; clinical trial (investigators assigned patients to the study factors)
- 10. Methods** are described in adequate detail except for the study factor. The study factor is "intensive oral care" performed by hygienists and dentists, but the authors do not identify what this means, whether it uses special dental instruments, or whether traditional caregivers could provide this kind of care. The authors break the methods section into subsections to explain each of the physiological measures, such as how to measure cough sensitivity and serum substance P. Another section is used to describe the study protocol. The other things missing from the methods section is a description of the recruitment process and method used to assign of study factors.
- 11. Results:** The primary research question is reported with both estimation of the difference between groups as well as hypothesis testing. There was a significant increase in cough reflexivity in the treatment group (log 1.5 to log 1.2, $p < 0.01$). The odds ratio improvement of cough reflex sensitivity was 5.3 (95% CI, 1.7 to 16, $p < 0.005$). The study findings were reported primarily in text. The main study finding was also shown in a graph, showing the change in sensitivity over time. All demographic information was reported directly as inference. statistics. The groups were compared using statistical tests to evaluate whether extraneous variables were similar across groups; the two groups seem to be equal.
- 12. The Discussion** was minimal. The authors do not explain why the log of the concentration is used rather than just the concentration. They also do not comment on the exponential nature of logarithmic variables and point out any pitfalls in interpretation. (Going from log2 to log3 is the equivalent of going from 100 to 1000.) The authors do compare their results to other studies, but primarily other studies that they conducted. Their study seems to fit with other findings. Power is not discussed, but as the study met statistical significance, it is not necessary. The researchers do not mention any limitations of their study. Overall, the discussion seems a little brief.
- 13.** The authors conclude that intensive oral care did increase cough sensitivity in the patients studied and thus could be part of a multi-approach strategy to prevent pneumonia in elderly patients.
- 14.** This study seems well executed and is a good piece of evidence that intensive oral care can increase cough reflex sensitivity to citric acid. However, the authors make no connection between cough sensitivity to citric acid and cough sensitivity to oral secretions. One may exist, but the authors have not cited it. Although the study was well executed, a few points keep this study from truly being applicable to nursing practice.

First is the omission of a description of "intensive oral care." It may be as simple as brushing and flossing the patient's teeth or as complicated as using a specialized ultrasonic cleaning device. The second problem is the limited nature of the population studied (nursing home patients with no respiratory illnesses). Regional bias may be present in terms of genetics, environment, and nursing home practice in the nursing home in Japan where this study took place. In general, this study suggests that nurses have yet another incentive to provide good oral care, but it does not give a good enough reason to change current standards of practice.

Summary:

Impaired cough reflex is a risk factor for aspiration pneumonia. Investigators randomly assigned nursing home patients to either intensive oral care or no intensive oral care. Intensive oral care was performed by the caregiver after every meal for a month. Patients assigned to no intensive oral care performed their usual oral hygiene for a month. Investigators measured serum substance P concentration, cognitive function, activities of daily living, and cough reflex sensitivity at baseline, 3 days, 10 days, and 30 days.

The two test groups were comparable for all extraneous factors. After 30 days, there was no change in cough reflex sensitivity for the usual care group. There was a significant increase in cough reflexivity in the treatment group (log 1.5 to log 1.2, $p < 0.01$). The odds ratio improvement of cough reflex sensitivity was 5.3 (95% CI, 1.7 to 16, $p < 0.005$). There were no changes in substance P concentration, cognitive function or ADLs. Conclusion: intensive oral care provided by caregivers after every meal may reduce aspiration pneumonia by improving cough reflex sensitivity.