



Introduction of Research

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What is Research?

- Investigation or experimentation aimed at the discovery and interpretation of facts, revision of accepted theories or laws in the light of new facts, or practical application of such new or revised theories or laws. (Webster Dictionary)
- Find a question, give it a possible answer and then use a scientific way to find out if the answer is correct. After find the answer you have to explain why or why not. (Chen)

How do I start?

- Find a question(s)
- Be curious
- Form a proper question
- Ask
- New ideas



Form a question



- George found the fruit, and he wants to know if he should eat it with the rind or not. He will form a research question:
 - Does it taste better if I eat it with the skin?
 - Does the skin makes the fruit taste better?
- The same rule.....
 - Does it makes DMFT lower if children rinse with fluoride mouth rinse?
 - Does the Fluoride mouth rinse reduce children caries rate?

Literature Review

- Focus in the question
 - Skin, taste, comparison
- Find what people think
 - Search if any one did the exam before? What's the result?
- Take the answer for both side
 - No prejudice, honest review
- Use your own way the categorize them
- Not a report, it's a summary
 - right to the points



Literature Review

- Use the proper resources
 - [Pubmed](#)
 - [E-journal](#)
 - Online resources: Google scholar, dogpile
 - [Cochrane Library](#)
 - [Library](#)

Hypothesis

- The answer you thought
- we are going to talk about it more detail in next class
- Example:
 - There is no difference in taste of banana between eat with rind or not.
 - There is no difference in Children DMFT between use fluoride mouth rinse or not.

Design the experiment

- That's why you do the literature review!
- Or you can improve some procedures
- Or you can come up with your own new ideas
- Talk to someone before you start
- Focus on the question you asked

Design the experiment

- Sampling
- Group size
- Inclusion and exclusion criteria
- Subject loss
- Materials and Methods
- Reliability
- Validity

Poor design

- One group design
- Norm group design
- Intact (non-equivalent) group design

Human sample involvement

- If the study sample is from human—teeth, tissue, survey, questionnaire
- You need to have consent form
- You need to write the proposal and send it to the institution research review board to approve the design
- HIPPA compliance

Collect data

- Follow the design and do it!
- Collect all the data according to what happened, even you think it might change the result.
- Enter the data in spread sheet—excel, spss, legal pad ...etc
- Be honest

Statistical analysis

- **Descriptive statistics**
 - Describe the data in hand
- **Inferential statistics**
 - Generate p value allow one to make inferences about the population of data
- **P value: probability**

Result

- Write up what you found in the test
- Be objective
- In detail
- Use table or graph to help

Discussion

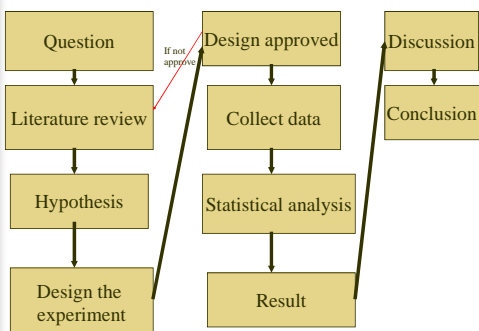
- Compare your result with the other papers
- Compare the main topic only
- Discuss the different result from your expectation
- Discuss what may make this study better

Conclusion

- Tell people what you found
- Short and powerful
- Answer the hypothesis question
 - EX: Banana tastes much better without rind.



Let's go over it again!



LLU MSD/ MS process

- You can choose either **one**
- Blaskboard Advanced dental education
- Research guideline by Dr. Naylor



Any question?



Here comes the assignment....
Please write a research proposal,
can be your own research or any
topic. Start from Introduction, till
the experiment design. Pass or
Fail, give it to me before Dec 18.