Topic #8

CORRELATIONAL DESIGNS

These are research designs where we measure two or more variables and attempt to determine the degree of relationship between them. These designs are characterized by the following:

1. no manipulation
2. low control
3. no causal inferences

Do not confuse correlational designs with correlations. Can have one without the other—that is, one does not automatically imply the other.

All things being equal, the mere fact that a study uses correlations to analyze data does **NOT** necessarily make it a correlational design.

Gum-disease link possible

By LEIGH HOPPER
Houston Chronicle Medical Writer

NEW ORLEANS - Gum disease and a common virus that infects more than half of American adults by age 40 may be linked to heart attacks, possibly by causing inflammation, researchers said Sunday at the American Heart Association meeting.

Although the nature of the connections is not clear, scientists say the findings point to new directions in treatment and prevention of heart disease.

People who have a heart attack are more likely to have serious inflammation of gum tissue know as periodontal disease than people with no known heart disease, according to a study of 38 men and women who were admitted to a hospital with a first heart attack. The patients were compared with 38 volunteers without coronary artery disease.

Eighty-five percent of the heart-attack patients had periodontal disease compared with 29 percent in the comparison group, said the study's leader, Dr. Efthymios Deliargyris, a cardiologist at the University of North Carolina.

Researchers believe high levels of C-reactive protein, or CRP, maybe a link between the two conditions. CRP is a sign, or marker, of inflammation and is elevated in heart-attack patients.

In another experiment, scientists found hints that cytomegalovirus, a virus that lies dormant in many adults, may have a direct relationship to the risk a woman has of developing atherosclerosis, the buildup of fatty deposits on artery walls.

Researchers looked at 87 women being evaluated for heart disease because of chest pain or other abnormalities. Among the women who tested negative for cytomegalovirus, 13 percent had coronary artery disease. Among those who tested positive for cytomegalovirus, up to 68 percent had diseased arteries.

Chocolate Eating Linked to Lower BMI
http://www.huffingtonpost.com/2012/03/26/chocolate-eating-lower-bmi-body-mass-index_n_1379368.html

Good news, chocolate fans.

A new study suggests that people who eat the sweet stuff may more frequently have lower BMI.

The research published Monday in the Archives of Internal Medicine finds that among approximately 1,000 Californians, age 20 to 85, individuals who consumed chocolate more frequently had a lower BMI than those who consumed it less often. (Body Mass Index is a measurement of height relative to weight.) Overall, participants ate chocolate an average of two times per week and exercised 3.6 times per week.

According to the study authors, the findings were not explained by having a better overall diet or engaging in more physical activity.

"We had data from a full food frequency questionnaire and found that [these people] didn't necessarily eat more fruits and vegetables, and they ate more saturated fat," said Dr. Beatrice Golomb, with the department of family and preventive medicine at the University of California, San Diego, and one of the study's authors. "But with or without adjustment for a range of other factors, we found the more frequent chocolate eaters had lower BMI."

The study's authors caution that the new study does not establish a cause and effect relationship between eating more chocolate and losing weight.

However, given prior research suggesting chocolate consumption may be beneficial for metabolic function, linking it to reduced risk of diabetes, stroke and heart attack, the authors claim that the new study may point to something beyond a mere association.

"Chocolate can be rich in antioxidants, which can protect against oxidative stress," said Golomb. "That has the ability to 'poison' cell metabolism a little bit."

She said that at the very least, the current study makes it clear that there's a "reasonably strong" possibility that something causal may be occurring and justifies further research.

Dr. David Katz, founding director of Yale University's Prevention Research Center and a blogger with The Huffington Post, said that attempting to establish a causal relationship from a cross-sectional study would be "informed guessing at best."

Still, he added that research has suggested that antioxidants might play a role in reducing inflammation, and that dark chocolate in particular might help balance the hormones that facilitate weight control.

Another key factor may be satiety.

"It may be that people who make it a regular part of their routine know that it really gets the job done," Katz said. "They think 'If I need a bit of pleasure, I'm not going to try and eat 11 other things first.'" He explained that what matters often in weight control is the number of calories it takes for people to feel full and satisfied, which accounts for why high calorie foods like walnuts can actually help people maintain their weight.

While it is not an emphasis of the new study, Katz cautioned that all chocolate is not created equal, particularly when it comes to potential health benefits. He suggested that people stick with dark chocolate.

"Dark chocolate, specifically if it's bittersweet -- if it's that that 60 percent or higher threshold -- is really rich in fiber, and it's filling," Katz said. "It can be intensely satisfying to eat, and often what we're looking for with food is satisfaction."

TYPES of correlational designs

– characterized by differences in the time frames if the collection of the IV and DV data
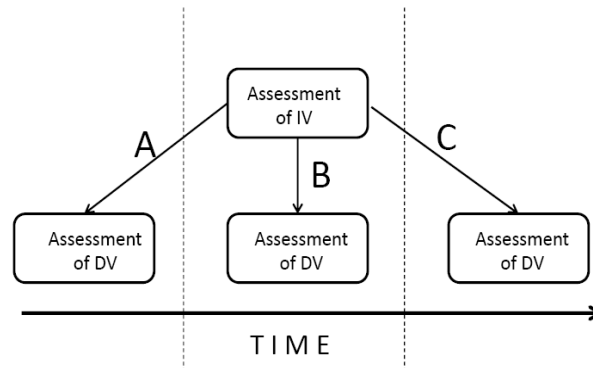
1. Predictive ➜ IV data are collected before DV data with an appreciable time interval between the two

2. Concurrent ➜ IV and DV data are collected at about the same time (i.e., concurrently) without any appreciable time interval between the two

3. Postdictive ➜ DV has been occurring in the past before the IV are collected

   ▪ Some methodological issues and concerns with postdictive designs:

     ● selective sampling
     ● instances where the occurrence of the DV may/could influence one's standing on the IV
     ● archival data—no control over how data were collected—unknown quality

       ▪ **Archival research**—refers to research conducted using data that the researcher had no part in collecting.

         Archival data are those that exist in public records, or archives. The researcher simply examines or selects the data for analysis.

         Limitations

         1. Most archival data are collected for unscientific reasons by people who are not researchers and thus, may not be very useful, may be incomplete, and may be subject to bias (e.g., insurance records, police reports).

         2. Because archival research is by nature carried out after the fact, ruling out alternative hypotheses for particular observed correlations may be difficult.

            – reliance on post hoc explanations elevates susceptibility to alternative explanations

QUESTION

Can we make causal inferences from correlational designs? And if we can, how strong will they be?