Research paper on research critique fish and bone health

Food & Diet

Calderon-Garcia et al. conducted a quantitative research study aimed at studying the effect of eating fish upon bone health (2013). The investigators did not identify any risks or benefits to the participants associated with the study. Given the study involves monitoring diet without modifications and doing standard medical examination tests and non-invasive measurements, this omission is not entirely inappropriate. Some of the benefits could have included the receipt of personal health information resulting from the extensive medical examination and detailed bone measurements. Risks would include those related to medical exams and use of ultrasound. The authors stated that the participants received and gave written, informed consent (Calderon-Garcia et al., 2013, 11), supporting a conclusion that participation was voluntary. The study was approved by the University of Extremadura's Office for Protection Against Research Risks.

Two major independent variables in this study are fish consumption and nutrients consumed due to fish consumption and both of these were identified and defined (Calderon-Garcia et al., 2013, 16). The major dependent variable in this study is bone density (Calderon-Garcia et al., 2013, 12). Fish consumption data was based on review of 7-day dietary records that recorded measured food quantities, a self-reporting questionnaire, and an interview (Calderon-Garcia et al., 2013, 12). Rationale for the measurement methods used was citation to two earlier studies and a statement that the person who performed the interview was blinded as to both the study question and hypothesis. The study used a single 7-day dietary record for each participant, so the time period of data collection was one week (Calderon-Garcia et al., 2013; Pedrera et al., 2001).

When a potential participant was identified for the study, a medical history interview, questionnaire, and physical examination including blood tests were performed. The questionnaire and interview were necessary to ensure exclusion of those with confounding medications or diseases (Calderon-Garcia et al., 2013, 12). If a participant entered the study, the bone density data was collected. The bone density data was collected using ultrasound measurement of the amplitude-dependent speed of sound (Ad-SoS) through the second to fifth proximal phalanges of the non-dominant hand (Calderon-Garcia et al., 2013, 12). Although the method of data collection for the food component was not described in detail, the data implies that at each meal for one week the participants were asked to quantify their food using various measuring means and record it in a food diary. At the end of the week, the food diary was collected and used to figure servings per week of fish, servings per week of other food sources, and nutrient intake (Calderon-Garcia et al., 2013, 13).

The investigators analyzed and reported the data in a variety of methods. After an opening table of the mean and range of all factors measured, the mean and range of various biological and anthropometric factors, nutrient intakes, and dietary habits were reported in relation to fish servings per week. Next, a best-fit relationship between the Ad-SoS (m/s) and fish consumption was graphed. A table reporting significance levels of the comparison between the fish servings per week and different measured groups was given. Further, the investigators provided a bar graph (cubic regression curve) showing the association of fish intake with bone mass. Two statements using the data were made: that carbohydrates in the 0-2

servings/week and fish consumption in 3-4 servings per week were predictive variables of bone mass after confounders adjustment, and body mass index (BMI) and fish consumption were the two variables that explained Ad-SoS variance (Caderon-Garcia et al., 2013, 18). Although the researchers did not include rigor of process discussions, statistical software was definitely used to determine the significance of the results and the relationships between the variables. Finally, there was no discussion of an attempt to eliminate researcher bias in this highly quantitative study. Caderon-Garcia et al. conclude that fish consumption was positively correlated with bone mass in the population studied (Caderon-Garcia, 2013, 19). Although with more frequent fish consumptions there was higher vitamin D, this did not correlate significantly with either absolute fish consumed, absolute vitamin D levels, or higher bone mass (Caderon-Garcia, 2013, 18). The inability to find complete correlations between food intake and bone density does seem like an accurate depiction of reality, as the biology is obviously extremely complex (Weaver and Mobley, 2007). A limitation identified by the researchers was because of the unclear timing between the fish consumption and higher bone density found, no true causal relationship could be drawn from this analysis (Caderon-Garcia et al., 2013, 19). The findings were generally logical, although there was truly only one statistically positive finding within all of the reported data. This study has implications for general nursing practice, as dietary counseling is a part of many nurses' function and the study does generally support the eating of more fish to improve bone health in premenopausal women. Some suggestions for further studies include attempting to identify the precise

nutrient within the fish that may be responsible for the increased bone density, such as looking more specifically at serum 25(OH)D, Zn, and n-3 fatty acid levels in relation to fish consumption.

References

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