

NUTR 885-034 Doctoral Seminar
Fall 2016
Mondays 12:20-1:10 pm
Rosenau 241

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This one credit course is designed as a forum for second year doctoral students to critically discuss papers from current, peer reviewed journals; identify gaps that need to be filled with future research; and consider appropriate experiment designs and implications of new research. It is hoped that through careful review of published research, students will improve their critical thinking skills and ability to integrate knowledge across the different areas of nutrition. More specifically we hope you will learn to:

1. "Think on your feet", that is, to answer questions about your knowledge or state your opinions clearly to your colleagues in a spontaneous manner.
2. Describe and interpret results presented in graphs and tables.
3. Identify how a paper contributes to our understanding of critical concepts.
4. Assess research designs: is the design appropriate for testing hypotheses set out by the authors?
5. Identify questions left unanswered by a research paper, and think critically about how to fill gaps.
6. Understand translational research in terms of the interrelationship of biochemistry/genetics, epidemiology and intervention/policy around selected nutrition topics (e.g. how findings in one field inform research in another; how scientific evidence is used in development of policy and interventions, etc.).
7. Articulate study aims and key elements of a study design to address a gap in scientific knowledge.

Topic: Does breastfeeding reduce the risk of obesity and cardio-metabolic disease? There is extensive literature on the benefits of breastfeeding for short term infant health. However, the benefits for long term health are less well understood. In particular, there is controversy over whether breastfeeding reduces later risk of obesity and diabetes. We will explore the biological basis and potential mechanisms through which breastfeeding and specific bioactive compounds in human milk may affect development of obesity and diabetes, critique the epidemiologic evidence of associations of infant feeding with later disease risk, and evaluate intervention and strategy policies to promote optimal infant feeding. For an overview and background, prior to the first class, please read:

American Academy of Pediatrics Policy Statement: Breastfeeding and the use of human milk. Pediatrics 2012; 129: e827

As background for the biology/biochem/physiology section:

Fields DA, Schneider CR, Pavela G. A narrative review of the associations between six bioactive components in breast milk and infant adiposity. *Obesity (Silver Spring)*. 2016 Jun;24(6):1213-21.

Garcia-Mantrana I, Collado MC. Obesity and overweight: Impact on maternal and milk microbiome and their role for infant health and nutrition ; *Mol Nutr Food Res*. 2016 May 9

Çatlı G, Olgaç Dünder N, Dünder BN. Adipokines in breast milk: an update. *J Clin Res Pediatr Endocrinol*. 2014 Dec;6(4):192-201.

REQUIREMENTS:

Students are expected to **attend all classes**. Special allowances will be made for students with legitimate conflicts that are communicated to the faculty in advance. For missed classes, students should answer the discussion questions in writing and submit them to the instructors.

Students are expected to **come to class prepared**: this requires that you carefully read the assigned article, work on the interpretation of graphs and tables, think about the issues raised in advance by the discussant, and do any background reading that might be required to understand the paper.

Students are expected to **actively participate in the discussions**. Don't be timid about voicing your opinions. Remember, there are no dumb questions, and don't be afraid to be wrong. You will not be judged on wrong answers! **Students who do not regularly participate in discussions are at risk of receiving an "L" in the course**. Grades are based on class participation (30%), leadership of discussion sessions (35%), and the written work (35%).

Students' Responsibilities as Discussants:

1. Serve as primary discussant for 2 papers.
2. Identify the key issues relevant to judging the quality and scientific contribution of the paper. For example, for many epidemiology papers, the focus is on sample selection, adequacy of sample size, quality of exposure and outcome data, measurement error, etc., while the issues for papers in other areas might relate to whether the correct animal model was chosen to test a hypothesis, whether the experimental design has sufficient power and is able to elucidate mechanisms, etc. In addition, think about how you can integrate information from each paper with other papers we have discussed, or other papers you have read, to address the broader question.
3. Develop a set of questions, centering on #2 above, to guide the review and discussion of the paper. Please email the questions to the 2 instructors for review and approval one week prior to the class (exception for the first class session), and then distribute to the rest of the class by email at least 5 days before the class so students have adequate time to prepare. Discussion questions should focus on issues most relevant to the paper, and cover design, sample, key theoretical issues, interpretation of graphs and tables, etc. Please consult with one of the class instructors and/or the "expert" about appropriate discussion questions.
4. Begin the class session with a 5 minute overview and summary of the paper. Identify the key issues relevant to the quality and significance of the paper. Identify the main point of the paper, and provide any additional background you think is needed to understand the paper. Guide the discussion and evaluation of the paper.

Written work:

For each of the 2 research design sessions, students should prepare a 1 page (~500 words) statement TO BE SUBMITTED BY NOON ON THE FRIDAY PRIOR TO THE RESEARCH DESIGN SESSION. This should:

1. Identify a key unanswered research question (1-3 sentences)
2. State a specific hypothesis

3. Outline a general approach to test the hypothesis
 - a. identify a population/sample
 - i. animal or human?
 - ii. Exclusions?
 - iii. basic characteristics of “subjects”
 - b. describe what will be done:
 - i. protocol/intervention
 - ii. approach to data analysis
4. Briefly summarize implications of findings

Students should adhere to the UNC Honor code. For written assignments, students may brainstorm research design ideas with one another, but written work should be done independently.

Schedule of Classes

Aug 29 Introduction, choice of topics

Sept 5 NO CLASS. LABOR DAY

Section 1: Epidemiology: Observational studies, and RCTs

What has been observed in population-based studies relating breast-feeding to later obesity and cardiometabolic disease? What are some of the key strengths and weaknesses of epidemiologic studies, and is there a basis for causal inference? Owing to ethical concerns, women cannot be randomized to breastfeed or formula feed their infants. Thus, the literature includes some RCTs of breast-feeding promotion, but these may still be limited in providing evidence for causal inference.

Sep 12 Student meetings with discussant partner

Sep 19 Observational Epidemiology Studies:

Modrek S, Basu S, Harding M, White JS, Bartick MC, Rodriguez E, Rosenberg KD. Does breastfeeding duration decrease child obesity? An instrumental variables analysis. *Pediatr Obes*. 2016 May 10.

OR...(discussant choice)

Hansstein FV. The Impact of Breastfeeding on Early Childhood Obesity: Evidence From the National Survey of Children's Health. *Am J Health Promot*. 2016 Mar;30(4):250-8

Sep 26 Martin RM1, Patel R, Kramer MS, Vilchuck K, Bogdanovich N, Sergeichick N, Gusina N, Foo Y, Palmer T, Thompson J, Gillman MW, Smith GD, Oken E. Effects of promoting longer-term and exclusive breastfeeding on cardiometabolic risk factors at age 11.5 years: a cluster-randomized, controlled trial. *Circulation*. 2014 Jan 21;129(3):321-9.

Section 2: The underlying biology and Physiology

Oct 3: Zepf FD, Rao P, Moore J, Stewart R, Ladino YM, Hartmann BT. Human breast milk and adipokines--A potential role for the soluble leptin receptor (sOb-R) in the regulation of infant energy intake and development. *Med Hypotheses*. 2016 Jan; 86:53-5. *Am J Clin Nutr*. 2016 May; 103(5): 1291-300

Oct 10: Priego T, Sánchez J, García AP, Palou A, Picó C. Maternal dietary fat affects milk fatty acid profile and impacts on weight gain and thermogenic capacity of suckling rats. *Lipids*. 2013 May; 48(5):481-95. doi: 10.1007/s11745-013-3764-8. Epub 2013 Feb 16.

Oct 17 : Lemas DJ, Young BE, Baker PR, Tomczik AC, Soderborg TK, Hernandez TL, de la Houssaye BA, Robertson CE, Rudolph MC, Ir D, Patinkin ZW, Krebs NF, Santorico SA, Weir T, Barbour LA, Frank DN, Friedman JE. Alterations in human milk leptin and insulin are associated with early changes in the infant intestinal microbiome. *Am J Clin Nutr*. 2016 May; 103(5):1291-300.

Oct 24 : Bernstein RM, Hinde K. Bioactive factors in milk across lactation: Maternal effects and influence on infant growth in rhesus macaques (*Macaca mulatta*). *Am J Primatol*. 2016 Aug;78(8):838-50.

Oct 31: Breij LM, Mulder MT, van Vark-van der Zee LC, Hokken-Koelega AC. Appetite-regulating hormones in early life and relationships with type of feeding and body composition in healthy term infants. *Eur J Nutr.* 2016 May 11.

Nov 9: Research Design Discussion

Section 3: Behavior, Intervention, and Policy issues

Nov 14 Nguyen PH, Kim SS, Nguyen TT, Hajeebhoy N, Tran LM, Alayon S, Ruel MT, Rawat R, Frongillo EA, Menon P. Exposure to mass media and interpersonal counseling has additive effects on exclusive breastfeeding and its psychosocial determinants among Vietnamese mothers. *Matern Child Nutr.* 2016 Jun 23

Nov 21 Rozga MR, Benton PA, Kerver JM, Olson BH. An Integrated Model of Breastfeeding Peer Counseling Support is Feasible and Associated with Improved Exclusive Breastfeeding. *Matern Child Health J.* 2016 Jul 16. [Epub ahead of print]

Nov 28 **Policy**

Mirkovic KR, Perrine CG, Scanlon KS. Paid Maternity Leave and Breastfeeding Outcomes. *Birth.* 2016 Mar 17.

Dec 5 **IP Research Design Discussion**