Nursing 3340B: Understanding and Using Research: Analyzing Data

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Class Time & Location: Online Asynchronous
Office: FIMS Nursing Building, Room 2321
Office Hours: By Appointment (in person or via Zoom)
Teaching Assistants: TBD (email); TBD (email); TBD (email)

Understanding and Using Research: Analyzing Data

Calendar Description

Students are introduced to basic concepts and techniques used to analyze quantitative data. This will include descriptive and inferential statistics and common methods for quantitative analysis and interpretation.

Expanded Description

The ability to interpret data analysis, critically analyze research results and implications enables nurses to engage in evidence informed practice. The course is an extension of the content covered in the research course (N2250) and will provide you with a basic foundation in the methods of quantitative data analysis commonly encountered in published research.

This course will include basic statistical concepts (e.g., levels of measurement, presenting data, descriptive statistics, and hypothesis testing) and sampling methods. In this course, you will focus on common statistical approaches used for analyzing data, and interpreting data output. The course will also include study design, and interpreting results of published research articles (primary, secondary, and tertiary) that will be presented in the lectures and covered in the assignments.

Pre-requisite: N2250

Course Weight: 0.50

Course Delivery

This course will be offered as an <u>asynchronous online learning experience</u>. You will complete weekly self-directed learning activities (i.e., readings, videos, etc.) that will be posted on the OWL Brightspace page. Lecture slides and recorded lectures will be posted on OWL each Sunday by 2355 hr. Weeks in the course will run Monday to Sunday. All students in this course must familiarize themselves with this course's OWL site.

Course Communication

For whole class discussion, please use the OWL Forums where you can post questions about course material. Peers, Teaching Assistants, and the instructor can all participate in answering questions. For emergent non-content-related questions, please email the TA/instructor in OWL and check the box for "*Send a copy of this message to recipient(s) email address(es).*" Individual or group office hours are available by appointment only.

Course Textbooks

Required

- Heavey, E. (2024). *Statistics for Nursing: A Practical Approach (4th ed.)*. Jones and Bartlett Learning. ISBN: 9781284254907\ *(Available for purchase at UWO bookstore)*

- https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2024B&courses%5B0%5D=001_UW/NUR3340B

Optional readings

- Optional readings can be downloaded from OWL Brightspace.

Recommended

American Psychological Association. (2018). *Publication manual of the American Psychological Association* (7th ed., revised). American Psychological Associations

Year 3 Goals:

- Practice nursing and justify clinical judgments using beginning research skills, evidence-based-practice, ethical principles, multiple ways of knowing, and critical and creative thinking.
- Implement reflective critical thinking strategies to enhance self-understanding, foster personal knowing, and refine one's nursing practice.
- Practice as a member of an interprofessional team to provide culturally sensitive client-centeredcare in a variety of settings.
- Analyze, organize, and reconstruct information to effectively communicate to others and informpractice.
- Advocate with others for public policy that will address health and social justice locally, nationally and internationally.
- Propose changes to the health care and social systems that respond to societal needs, and generate possibilities for the nursing profession in accordance with the proposed changes.
- Practice competently and ethically in accordance with professional requirements.

Course Goals (Reflect Year 3 goals #1, 2, 3, 4, & 7):

- To understand and describe the research processes of quantitative data analysis
- To identify and determine the appropriateness of specific quantitative analysis methods reported in published research
- To assess the rigour of quantitative data analysis in published research
- To understand the results of published quantitative studies.

CNO Competencies
Competencies for entry-level Registered Nurse practice (CNO, 2020) addressed in thecourse:
https://www.cno.org/globalassets/docs/reg/41037-entry-to-practice-competencies-2020.pdf

- Clinician: 1.1, 1.10, 1.11, 1.13 1.2, 1.5, 1.6
- Professional: 2.1
- Communicator: 3.4
- Collaborator: 4.3
- Leader: 6.5, 6.9, 6.10

- Scholar: 9.3

National Interprofessional Competencies (CIHC, 2010)
Competencies addressed in the course:

- Interprofessional communication
- Role clarification
- Team functioning

Nursing Informatics Competencies (CASN, 2012)
Competencies addressed in the course:

- Uses relevant information and knowledge to support the delivery of evidence-informed patient care
- Uses ICTs in accordance with professional and regulatory standards and workplace policies
- Uses information and communication technologies in the delivery of patient/client care

Professional Development in Nursing
Many of you may question why nurses at the baccalaureate level need to understand the basics of data analysis. This is an excellent question and is partially addressed by the recognition of nursing as a health sciences profession. Inherent in many definitions of a profession is the notion that professionals fulfill a distinctive function in society and that the function that is fulfilled is based on evidence that has a foundation in scientific inquiry. The health care system is in a constant state of evolution, and inquiry based on sound data analysis can help nursing to engage in evidence-informed decision making to enhance nursing practice, promote quality patient care and improve health. As evidence informed practices become the norm in health care, the numberof nurses who are conducting and using research in practice will continue to increase.

As a consumer of research you will need to understand how research results are generated in order to critically appraise their implications for clinical practice. As well, the same analytic approaches are often used to evaluate healthcare programs and projects to meet accreditation and other standards. Although you may not conduct full research studies at the baccalaureate level of education, you will likely participate in program and service evaluations as part of practice. This course will prepare you for these various roles in practice.

Interprofessional Development
This course will provide students with the basis from which to expand conceptualizations related to how knowledge is generated within the healthcare sector. Subsequently, other healthcare team members' contributions in research process will be described and explored from an interprofessional perspective. Insights will be provided as to how nursing can become further involved in inter-professional research through the use of various exemplar case studies, analysisstrategies, and other learning material related to knowledge translation for professional practice.

This course will cover the following concepts which can be used as a statistics prerequisite:

- Frequency distributions and skewness
- Measures of central tendency: mean, median, mode
- Levels of measurements: nominal, ordinal, interval/ratio
- Measures of variation: Standard deviation, standard score, standard error
- Probability, normal curve
- Sampling methods, effect size, and power
- Tests of significance: Null hypothesis: t-test, one-tail/two tail tests
- Analysis for proportions and categories (e.g., Chi-square)
- Analyses for group means (e.g., t-tests, analysis of variance)
- Correlation
- Regression analysis (e.g., Linear regression, quantifying an association, logistic regression)
- Relative risk

Course Schedule and Readings

Week	Dates (Mon-Sun)	Topic	Textbook Readings
1	January 6 – January 12, 2025	• Introduction to course, OWL navigation, review course materials, importance of Tri-Council Policy Statement	
2	January 13 – January 19, 2025	• Review of Introductory Concepts • The Research Process *Tri-Council Policy Statement (due by January 17, 2025)*	Chapter 1
3	January 20 – January 26, 2025	• Introduction to Statistics • Visualizing data	Chapter 2
4	January 27- February 2, 2025	• Descriptive statistics • Central tendency *Discussion Board Participation (due by Jan. 31, 2025)*	Chapter 3
5	February 3 – February 9, 2025	• Generating Research: Feasibility, Validity, Reliability • Hypothesis testing	Chapter 6 Chapter 4 (pgs. 54-58)
6	February 10- February 14, 2025	• Sampling methods • Sample size, effect size, and power *Quiz #1 (due by February 14, 2025)* *Assigned Groups for Critical Appraisal*	Chapter 5 Chapter 7
7	February 15 – February 23, 2025	Reading Week	No classes
8	February 24 – March 2, 2025	• Chi-Square • T-tests *Discussion Board Participation (due by Feb. 28, 2025)*	Chapter 8 Chapter 9
9	March 3 – March 9, 2025	• Bivariate Association of Data • Correlation *Critical Appraisal (due by March 7, 2025)*	Chapter 11
10	March 10 – March 16, 2025	• Comparing more than two groups (ANOVA)	Chapter 10
11	March 17 – March 23, 2025	• Introduction to Regression Analysis *Quiz #2 (due by March 21, 2025)*	Chapter 12
12	March 24 – March 30, 2025	• Relative Risk and other common measures	Chapter 13
13	March 31, 2025 – April 4, 2025	• Brief review of concepts not covered in the course • Nursing practice and statistics • Knowledge Mobilization *Data Analytic Plan (due by March 31, 2025)*	

Evaluation

Evaluation	Value	Due Date
Tri-Council Policy Statement (TCPS)	**10%**	• January 17, 2025
Discussions/Online Participation	**20%** (10% x 2)	• Discussion 1: Jan 31, 2025 • Discussion 2: Feb 28, 2025
Quizzes	**30%** (15% x 2)	• Quiz 1 due by: Feb 14, 2025 • Quiz 2 due by: Mar 21, 2025
Group Critical Appraisal Assignment	**20%**	• March 7, 2025
Data Analytic Plan	**20%**	• March 31, 2025

1. **Tri-Council Policy Statement (TCPS): 10%**

Students must individually complete the TCPS 2 – CORE-2-22 online course on research ethics provided by the Government of Canada. Go to https://tcps2core.ca/welcome and click on Create Account. After making an account, navigate through all online modules. After completing the *Knowledge Consolidation Exercise* you will be provided a TCPS 2 certificate. Please upload this certificate to OWL under the Assignments tab. Each student will require their own TCPS 2 certificate. This assignment is graded as a PASS/FAIL.

2. **Discussions/Online Participation**
   a. **Discussion #1 (10%)**
   b. **Discussion #2 (10%)**

Students will be asked to reflect on course content using the dedicated discussion board twice during the course (Week 4 and Week 8). The purpose of these reflections are to demonstrate your critical thinking and ability to apply statistical knowledge. Write a response to the reflection prompt that is between 300 to 500 words and respond conversationally to at least one of your peer's discussion board postings.

3. **Quizzes:**
   a. **Quiz #1 (15%)**
   b. **Quiz #2 (15%)**

The test portal on Brightspace will open two weeks prior to each quiz deadline. Students will choose a date and time during this two-week window which is convenient to complete quizzes. Quiz one will cover content from weeks 2 to 5, while Quiz two will cover content from week 6 to 10. Quizzes will consist of a variety of question types (e.g., multiple choice, fill in the blank, etc.). Each quiz provides the student with an opportunity to review course content and demonstrate application of course concepts.

4. **Group Critical Appraisal Paper (20%)**

Students will work in groups (assigned during week 6) to review a single research article and critically appraise it focusing specifically on the analysis. Students will choose from one of three pre-selected quantitative studies. One assignment should be submitted per group, and students may submit this assignment any time until the due date. Detailed assignment and rubric documents will be provided on Brightspace.

5. **Data Analytic Plan (20%)**

Students will work independently to complete a Data Analytic Plan. This assignment is intended to allow students to apply course concepts in a practical way. They will be provided with a short background description of the proposed study. **Students will design an outline of a Data Analytic Plan (Including the headings**: **Objective** (specific goals of the analytic plan), **Methods** (Data collection approach, Inclusion/Exclusion Criteria), **Data Analysis** (Analytic approaches to be used), **Interpretation** (How will findings be interpreted? Implications for Nursing practice, Key stakeholders to share results with). A detailed assignment description and rubric will be provided on Brightspace. *Data Analytic Plans should be no longer than 2 pages (Single Spaced)*.

***There is no final exam during the exam period for this course. Once you have completed the course content, quizzes, and assignments, you will have completed the course. ***

Policies

All policies related to assignments are in the Undergraduate BScN Programs Manual on the Western web site at owl.uwo.ca and on the Fanshawe College web site in the Program manual located in the Virtual Home Room at www.fanshaweonline.ca

Engagement

Due to the significance of theoretical and practice knowledge in developing professional competence, students are expected to demonstrate professional responsibility through regular participation in all scheduled learning activities. Much of the learning that takes place is a result of preparation and engagement with the course material and active dialogue with colleagues and faculty. Lack of engagement with the material will directly hinder one's success in the course.

Statement on Plagiarism

Student work is expected to be original; assignments and online postings should be written in your own words. An idea or a passage from another author must be acknowledged by using quotation marks, where appropriate, and proper APA 7th Ed. referencing.

While use of AI-based content creating platforms (e.g., ChatGPT) can be useful to assist in information collection and problem-solving of complex scenarios, outputs generated from these platforms need to attribute in terms of direct citation/quote and referencing as per writing style (e.g., APA 7th), if used in assignments or course participation. In other words, AI-generated content, while interesting and potentially informative to assist in the refinement of ideas and insights, should not be used verbatim or suggested to be original content generated by student(s) for assignments in this course. If outputs from AI-based content creating platforms are used verbatim, they must be attributed and cited accordingly.

Plagiarism is a serious academic offence and could lead to expulsion from the nursing program. ***You are plagiarizing if you insert a phrase, sentence or paragraph taken directly from another author without acknowledging the work to belong to them. Similarly, you are plagiarizing if you paraphrase or summarize another author's ideas without acknowledging that the ideas belong to someone else. You are self-plagiarizing when you reuse all or part of an assignment that you previously submitted.*** Students can not present their credited work as new scholarship. You may be asked to submit your work, at the discretion of the course instructor, to turnitin.com to verify originality (see 26 *Undergraduate BScN Programs Manual 2013 - 2014* Scholastic Offence Policy in the Western Academic Calendar or Fanshawe College Policy Manual).

Scholastic offences are serious, and students should read the policy as to what constitutes a Scholastic Offence at the following site:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf

Assignments and Exams
Please refer to the Undergraduate Programs Manual for information on penalties for late assignments, re-grading of assignments, and the protocol for missed tests. Western at owl.uwo.ca or Fanshawe in Virtual Home Room www.fanshaweonline.ca

Mental Health
Students who are in emotional/mental distress should refer to the following links for a complete list of options about how to obtain help. MentalHealth@Western
http://www.uwo.ca/uwocom/mentalhealth/ Counseling Services
http://www.fanshawec.ca/counselling/

Accessibility, Accommodation and Support Services at Western
Technical Support: For OWL support contact the WTS HelpDesk at
https://wts.uwo.ca/helpdesk/index.html

New to Online Learning? Check out the following link for a variety of to support online learning from Western StudentExperience: https://www.uwo.ca/se/digital/

Academic Support and Accommodation Services: Check out these services that support academic success. I encourage all students to engage in the writing supports available to them at Western. http://academicsupport.uwo.ca/accessible_education/index.html

Physical Health, Wellness Education and Mental Health: Connect with Student Health Services at Western here: https://www.uwo.ca/health/Physical%20Health/index.html

Indigenous Student Center staff and Elders are available to support you personally, academically and culturally. Reach out at: https://indigenous.uwo.ca/students/

For services related to inclusion, equity and diversity visit *Equity and Human Rights Services*: https://www.uwo.ca/equity/

View Westerns *Anti-Racism Working Group Report* here: https://president.uwo.ca/anti-racism/