**Introduction to Research in Kinesiology**

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**Chapter Overview**

**Introduction: Current Knowledge in Kinesiology**

* Kinesiology is continuously growing and incorporates multidisciplinary knowledge and research.
* Kinesiology graduates can be found in professional health programs (such as physical therapy, occupational therapy, dentistry, nursing, medicine), professions (such as a police officer, paramedic, firefighter), or leaders (business, or government).
* The field of kinesiology has a wide range of subdisciplines as core curriculums include courses in human anatomy, human physiology, exercise physiology, biomechanics, motor learning/motor control, and psychology of physical activity, as well as additional courses in the social sciences and humanities, statistics, and research methods.

**Introduction to Research Methods in Kinesiology**

* Science is the discovery of knowledge, whereas research is the scientific method used to discover that knowledge.
* There are three approaches to research:
	+ Quantitative research requires the generation of numerical (i.e., quantitative) data to answer research questions.
		- Best suited to questions relating to testing of theory, status on variables, differences among groups and relationships between variables
	+ Qualitative research is based on the generation and interpretation of non-numerical (i.e., qualitative) data.
		- Main sources include open-ended interviews, direct observation, and written documents.
	+ Mixed-methods research is used by researchers who see value in using both quantitative and qualitative data to answer their research question(s).
		- Can be simultaneous or sequential in nature

**Components of a Research Design**

* There are three components of research design:
	+ Philosophical Worldview: Researchers’ beliefs about the world and the nature of research
	+ Research Approach
		- Qualitative
		- Quantitative
		- Mixed Methods
	+ Research Methods: Specific methods of data collection, analysis, and interpretation

**Philosophical Worldviews as Guiding Frameworks of Research**

* There are five worldviews common to kinesiology:
	+ Postpositivism: Premised on the notion that there is a single reality or objective truth to be discovered through research.
	+ Constructivism: Based on the notion that multiple realities exist and that meaning is varied and complex.
	+ Pragmatism: Premised on the idea that researchers need to be concerned with solutions rather than problems.
	+ Transformative: Based on the notion that research needs to be closely connected with politics and have an action agenda to advocate for marginalized peoples.
	+ Two-eyed seeing: Reflects the “bringing-together” of knowledge by using the analogy of two eyes, with one eye seeing from the strengths of Indigenous ways of knowing and the other eye seeing from the strengths of Western ways of knowing

**Learning Objectives**

By the end of this chapter, students should be able to:

* Discuss how the research process is important to understanding the current knowledge base in kinesiology;
* Describe a variety of research methods used in kinesiology; and
* Identify implications that different philosophical worldviews have on the research process.

**Suggested Class Activities**

**Activity #1**

**Part A**

**Teaching Objective**: Have students be able to differentiate between quantitative and qualitative designs.

**Procedure**: Circulate the article below before the lecture and ask the students to be familiar with it. During the lecture, place the abstract of the study on the projector screen and allow students a few minutes to read it over. Ask them to identify key features/methods that make it a quantitative design. Then, ask them how this study could have been completed using qualitative methodologies. What information might be lost? What information might be gained?

* Potential Reference: Du Preez, E. J., Graham, K. S., Gan, T. Y., Moses, B., Ball, C., & Kuah, D. E. (2017). Depression, anxiety, and alcohol use in elite rugby league players over a competitive season. *Clinical Journal of Sport Medicine*, *27*(6), 530-535.

**Abstract:**

**Objective:** To assess the prevalence of symptoms of depression, anxiety, and rates of alcohol misuse in elite rugby league players in Australasia.

**Design:** A cross-sectional, epidemiological study with repeated measures**.**

**Setting:** Surveys were conducted during the 2015 preseason and in-season. **Participants:** Four hundred four elite rugby league players participated preseason and 278 players in-season.

**Main Outcome Measures:** Symptoms of depression were measured using the Patient Health Questionnaire-9 scale, symptoms of generalized anxiety disorder (GAD) with the GAD-7 scale, and the Alcohol Use Disorders Identification Test Consumption scale was used to assess hazardous alcohol use.

**Results:** The overall prevalence of depression was 12.6% preseason and 10.1% in-season. Generalized anxiety disorder had a prevalence of 14.6% and 10.1% for these 2 periods. Overall, 68.6% of players had hazardous levels of alcohol use preseason, and 62.8% in-season. There was no significant difference for any of the main outcomes between the periods. Players with a history of mental illnesses had 5.62 greater odds (95% confidence interval [CI], 2.62-12.04) of depression than those without during preseason, and 22.08 greater odds (95% CI, 7.77-62.71) in-season. Players reporting ≥3 previous concussions had 2.02 greater odds (95% CI, 1.07-3.82) of depression than those reporting ≤2 in the preseason sample.

**Conclusions:** Rugby league players have a lower prevalence of depression compared with studies of the general population and other athletes, but a higher prevalence of GAD, and high rates of alcohol misuse. Clubs may consider implementing regular screening for these conditions. Further prospective research to determine causality of independent factors is required.

**Part B**

**Teaching Objective**: Have students be able to differentiate between quantitative and qualitative designs.

**Procedure**: Circulate the article below before the lecture and ask the students to be familiar with it. During the lecture, place the abstract of the study on the projector screen and allow students a few minutes to read it over. Ask them to identify key features/methods that make it a qualitative design. Then, ask them how this study could have been completed using quantitative methodologies. What information might be lost? What information might be gained?

* Potential Reference: Self, M., Driver, S., Stevens, L., & Warren, A. M. (2013). Physical activity experiences of individuals living with a traumatic brain injury: A qualitative research exploration. Adapted Physical Activity Quarterly, 30(1), 20-39.

**Abstract:**

Traumatic brain injury (TBI) is a significant public health issue due to the incidence, complexity, and cost associated with treatment. The purpose of this study was to determine physical activity (PA) knowledge, attitudes, intentions, and barriers among individuals with a TBI undergoing outpatient rehabilitation. Seventeen participants completed a series of group interviews regarding their PA needs. A qualitative research design was adopted and trustworthiness was established through investigator triangulation of data. A cross-case analysis was completed to identify themes and conceptual patterns. The main themes identified were (a) an inability to differentiate between PA and physical therapy, (b) a limited knowledge of PA health benefits and the relationship to rehabilitation, and (c) an interest in participating in a PA-based health promotion program. Future interventions should educate individuals about PA, the associated health benefits, and the role PA plays in the rehabilitation process.

**Activity #2**

**Teaching Objective**: Identify features of mixed-methods design and how to design a mixed-methods study.

**Procedure**: In class, display a list of topics relevant to kinesiology (i.e., physical activity, exercise, obesity, sedentary behaviour, anxiety, depression, stress, body image, pride, shame, guilt, sport participation, sport dropout…). Have the students choose two topics (or variables) from the list that are of interest to them and think of a potential research question to examine the relationship between these two variables. Then, have them come up with a (basic) potential mixed-methods design to study this relationship. Following this, have them share their proposed study with the student sitting beside them. To conclude, ask the class if anyone has any lingering questions about mixed-methods research, and then remind them of some key features of mixed-methods design.

**Activity #3**

**Teaching Objective**: Understand the key features of the five philosophical worldviews, and be aware of the types of research that correspond with those worldviews.

**Procedure**: Split the students into five separate and equal groups (based on where they are sitting in the lecture hall for example). Assign each group one of the five philosophical worldviews (postpositivism, constructivism, pragmatism, transformative, two-eyed seeing). Ask students to independently think of a study they could potentially design (based on their interests) that would be guided by that worldview. After giving them time to brainstorm about their potential study, have them get into new groups of five, with the groups being composed of one individual from each of the five worldview categories. Have the students go around and share with their groups the study they proposed, based on their assigned philosophical worldview. When they are finished, address any questions they may have, and display Table 1.1 (“Philosophical Worldviews as Guiding Frameworks of Research”) on the projector screen as a reminder about the distinguishing features of each worldview.

**In-Class Discussion Questions**

1. Why is it important for kinesiologists (or anyone working in a related field) to understand where knowledge comes from and how it is reproduced? (See “Introduction to Research Methods in Kinesiology”)
* Generate discussion around science vs. research.
* Ask for some examples of how research can be translated into practice in kinesiology or related fields.
1. In what contexts might you use a quantitative approach vs. a qualitative approach? (See “Introduction to Research Methods in Kinesiology”)
* How do you decide which one to use vs. the other?
* Is one approach better than the other?
* In what contexts might it be best to use a mixed-methods approach?
1. What considerations must be taken when choosing a philosophical worldview? (See “Philosophical Worldviews as Guiding Frameworks of Research”)
* Are there situations in which multiple worldviews may be appropriate?
* If so, how do you go about choosing the most appropriate one?

**Additional Resources/Websites/Video links**

**Readings**

* Creswell, J. (2013). Research design: Qualitative, quantitative, and mixed methods approaches. (4th ed.). SAGE Publications.
* Martin, D. H. (2012). Two-eyed seeing: A framework for understanding Indigenous and non-Indigenous approaches to Indigenous health research. CJNR (Canadian Journal of Nursing Research), 44(2), 20-42.
* Pitney, W. A., & Parker, J. (2001). Qualitative inquiry in athletic training: Principles, possibilities, and promises. Journal of Athletic Training, 36(2), 185–189. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC155534/
* Slevitch, L. (2011). Qualitative and quantitative methodologies compared: Ontological and epistemological perspectives. Journal of Quality Assurance in Hospitality & Tourism, 12(1), 73-81.https://journals-scholarsportalinfo.myaccess.library.utoronto.ca/pdf/1528008x/v12i0001/73\_qaqmcoaep.xml
* Taylor, B, Desley, H, & Francis, K. (2013). Qualitative research in the health sciences: Methodologies, methods and processes. Routledge.
* Draper, C.. (2016). Role of qualitative research in exercise science and sports medicine. *South African Journal of Sports Medicine*, *21*(1). https://doi.org/10.17159/2413-3108/2009/v21i1a569

**Websites**

* <https://www.mcgill.ca/mqhrg/resources/what-difference-between-qualitative-and-quantitative-research>
* <http://www.humankinetics.com/excerpts/excerpts/incorporate-quantitative-and-qualitative-methods-into-your-research>
* <https://www.youtube.com/watch?v=P8UFS5PE_Mw>

**Essay/Long-Answer Exam Questions**

1. What is the relationship between a philosophical worldview, an ontology, and an epistemology? How are they related? Define each of them.
2. Describe the relationship between a worldview, an approach, and methods.
3. There has been a great deal of research in recent years examining the relationship between physical activity and stress (in various populations, contexts, etc.). How might the relationship between these two variables be looked at with a:
4. Quantitative approach?
5. Qualitative approach?
6. Mixed-methods approach?
7. Choose one of the five philosophical worldviews (postpositivism, constructivism, pragmatism, transformative, and two-eyed seeing) and propose a study that could be conducted following this worldview. Be sure to include which main research approach it would be and the main features of that worldview.
8. What are the strengths of mixed-methods research? Why might a researcher opt to pursue mixed-methods research rather than quantitative or qualitative?
9. Describe the philosophical worldview of two-eyed seeing.
10. What are the key features of this worldview?
11. What type of knowledge does this worldview draw upon?
12. What is this worldview premised upon?
13. Explain the difference between science and research in the context of kinesiology.
14. Think about your own interests in the world of kinesiology. Choose one research approach and one philosophical worldview that you think best aligns with your research interests and explain why.
15. Sedentary behaviour is increasingly being associated with negative health outcomes such as obesity, diabetes, and depression. Choose one negative health outcome of sedentary behaviour (doesn’t have to be listed here) and explain how the relationship between that outcome and sedentary behaviour may be investigated:
16. Quantitatively
17. Qualitatively
18. Using mixed methods
19. Complete the following table given each worldview’s main feature (s) and main research approaches. Based on Table 1.1 (“Philosophical Worldviews as Guiding Frameworks of Research”).

|  |  |  |
| --- | --- | --- |
| Worldview | Main Feature (s) | Main Research Approach(es) |
| Postpositivism |  |  |
| Constructivism |  |  |
| Pragmatism |  |  |
| Transformative |  |  |
| Two-eyed Seeing |  |  |

1. You are asked to complete a study looking at the experiences of nurses working the night shift in a hospital. What research approach would you use (quantitative approach, qualitative approach, or mixed-methods approach)? How would you collect the data?

**Case Studies**

**Case Study #1**

You are an undergraduate kinesiology student taking an exercise psychology class. One day, a master’s student comes to give a guest lecture to your class on the relationship between physical activity and anxiety. The student claims that she has just made a huge discovery in her lab: that any intensity of exercise, in any form, earlier in life, can reduce everyone’s risk of generalized anxiety disorder later in life. Although you are excited about the possibility of these findings being true, you also find them a bit hard to believe. Could this master’s student really have discovered such a broad and far-reaching finding?

**Discussion Questions**:

1. What questions might you ask the master’s student to critique the findings that she is claiming to be true?
2. How would you go about testing for yourself whether these claims are indeed correct?
3. Would you employ a qualitative, quantitative, or mixed-methods approach?

**Case Study #2**

You are an undergraduate kinesiology student taking an independent research course with a professor who specializes in qualitative research. You propose that you are interested in a research project that aims to investigate access to physical activity opportunities for low-income, racialized youth in priority neighbourhoods around Toronto. You emphasize to the professor that you are particularly interested in working directly with the community and the participants to eventually effect change, through increasing physical activity opportunities and thereby participation rates in these communities. Your professor suggests that a pragmatic worldview would be most appropriate for this project.

**Discussion Questions**:

1. Do you agree with the professor that this is the most appropriate worldview for this project? If yes, justify your response.
2. What components of the worldview correspond with this particular project? If no, what philosophical worldview do you think might be more appropriate? What components of that worldview correspond with this particular project?
3. Based on your answer to question #1, given your chosen worldview, what type of research approach would you undertake for this project? Justify your response.