Revisiting case study as a nursing research design

Case study research provides nurses with a form of inquiry that is holistic and appropriate for a variety of populations. Jeanine Gangeness and Eleanor Yurkovich discuss components of case study research, including its theoretical base, design methods, multiple data sources and analysis. The information presented is expanded on by using a planned population-based, multiple-case explanatory study.

Introduction
Case study research provides nurses with a form of inquiry that is holistic and appropriate for a variety of populations. This holistic design fits well with the meta-paradigm of nursing (person, environment, health and nursing). However, published case study research in nursing and population health is limited. The epistemological bases for qualitative case study can be either critical theory or critical feminism (Creswell 1998); this article will adhere to critical feminist grounding. The authors will examine case study by discussing critical-feminist grounding, design, methods, multiple-data sources, analysis and nursing implications. A planned study focusing on rural women and their built environment exemplifies case study research design and method.

Key words
- case study
- research methodology
- critical theory
- feminist theory
addition, the authors present how a novice nurse researcher moves through the planning of a population case study.

**Overview**

When choosing a method of inquiry, the nurse researcher ponders what the focus of the study is and how to achieve it. The researcher reflects on the connection between self, method and feasibility of the research project, which enhances awareness of bias/subjectivity. The nurse researcher who values holism within context and participant-engaging methodology will find case study to be a good fit.

Case study research may focus on individuals, groups and organisations, as well as other social phenomena (Yin 2003a). It uses a multi-source approach to data collection that provides the researcher with a wider, in-depth assessment appropriate to population inquiry (Creswell 1998, Yin 2003a). Therefore, case study research is a systematic analysis of multiple forms of data that enhances understanding of a given context and those who live in that context.

Case study research presents itself in a variety of modalities. First, the case study is either a single case or multiple cases. Single case studies examine one case, whereas multiple case studies consider many (Yin 2003b). After determining the number of cases, research questions direct the study towards an explanatory, exploratory or descriptive design. An explanatory case study focuses on cause-effect relationships considering how or why something happens. Research questions reflect this focus. An exploratory case study evaluates a given situation within a context and as a precursor to future research, defining questions for future studies (Yin 2003b). A descriptive case study ‘presents a complete description of a phenomenon within its context’ (Yin 2003b). Explanatory, exploratory or descriptive could use a single-case or a multiple-case approach. The planned study is a multiple-case, exploratory design grounded in critical feminism.

**Critical-feminism**

Critical-feminists believe that individuals and groups that experience oppression understand the world better and have insight into creating a better world
Explaining and defining world context is essential for the feminist researcher, as context contributes to the experience and this lived experience is the very essence of the feminist voice (Bond and Mulvey 2000).

Society places women in an oppressed minority group, when compared to men (majority). Compounding the oppression towards women are the health disparities that women experience as a population; these disparities are particularly evident for women and weight-management experiences (Im and Meleis 1999). Women influence the health-promoting and health-seeking behaviours of their families, thus this behaviour becomes inter-generational (Norcross et al 1996).

Women also experience health disparity because of rural culture, which includes low levels of physical activity, higher dietary fat intake, higher levels of television watching and limited resources to decrease these unhealthy behaviours (Tai-Seale and Chandler 2003). Furthermore, rurality affects health and physical activity in many ways, such as a decrease in socio-economic opportunity, reduced healthcare availability and limited physical or built environment dependent on government support. The combination of these factors places rural residents at a higher risk of inactivity. The intent of feminism is to hear the voice of women, understand the perspective of women, emancipate oppressed women and appreciate the diversity of human experiences (Fraser and Strang 2004). Ruralism and womanhood fit well with critical-feminism, which grounds the planned case study research and helps readers to appreciate the lens used in the conception of the entire design. Also, because case study design considers context and complexity, respect and emancipation are natural by-products.

The focus of the planned case study is on rural women and the embedded phenomenon of physical activity within their built environment. The planned case study centres on two rural communities meeting the federal rural definition of having a population of 2,500 or under (United States Department of Agriculture 2003).

**Design**

Designing a case study is a process that takes time and commitment to both case study methodology and the topic of research. Yin (2003b) identifies
qualitative perspectives

essential components to case study design (Table 1). These components create the structure and boundaries that support rigour.

<table>
<thead>
<tr>
<th>Study questions</th>
<th>Exploratory</th>
<th>Explanatory</th>
<th>Descriptive</th>
<th>Proposed study</th>
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<td>Propositions</td>
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<td>Purpose</td>
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<td>Units of analysis</td>
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<td>Logic (linking data to propositions)</td>
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<td>Criteria for interpreting findings</td>
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**Research questions**

Research questions in case study design begin with ‘how’ or ‘why’ (Yin 2003a) and determine the type of case study. The following is a list of questions that fit the planned multiple case explanatory study:

- How does the built environment promote physical activity of rural communities?
- How do rural women use built environments?
- Why do rural women use built environments?
- How does the built environment need improvement in rural communities?
- How do policies influence rural built environments?
- How does the community powerbase affect development of built environments?
- How does the community powerbase affect women’s use of built environments?

**Propositions and purpose**

In addition to research questions, propositions are used to focus the case study process during analysis. Propositions are the specifics or details within the scope of the study and are not necessarily mentioned in research questions. Propositions are statements of expected outcomes, similar to a
hypothesis. These statements are supported or rejected during data analysis. The researcher develops propositions prior to collecting data. Propositions are not intended to predict study results; instead, they are a way for the researcher to expose any preconceived beliefs about the topic. This helps the researcher to move into the study admitting any bias. Propositions are generally not included in exploratory studies (Yin 2003a); a purpose is developed instead. Table 2 shows potential propositions for the planned case study.

### Table 2. Example propositions

- Rural built environments support physical activity of rural women
- Rural built environments conducive to physical activity are not available to rural women
- Rural women use built environments to walk, bike and jog
- Rural women obtain physical activity in their homes with purchased exercise equipment
- Built environments in rural communities are in poor repair and difficult to use
- Policies at the state and federal levels are barriers to communities with low population density (rural)
- The opinions of rural women are not considered when local governments develop built environments that encourage physical activity

### Unit of analysis

The unit of analysis refers to what is studied, which could be an individual, family, community, organisation, a state or even a nation. Stake (2000) approaches case study not as a method but by defining the unit under study. A tight definition of case/unit will guide the outcomes of the study: the definition is determined early in the planning process.

Case/unit definition should state who is included, context, phenomenon and time-period being studied. The planned case study includes two rural communities chosen because of their rural location and population. The phenomena under study are rural women aged 18 to 70 and built environment resources in their rural context. The women will have resided in the community for five years or more. The built environment will include resources that hinder or promote physical activity and includes ‘human-modified places such as homes, schools, workplaces, parks, industrial areas, farms, roads and highways’ (Srinivasan et al 2003). The time period will be bound by
the data collection: a case study of the present. Although this study will ask participants to project into the future for purposes of improving the current situation, that period is not the focus of the study. Once the definition of the case/unit is determined, there is a review of research questions and propositions to determine fit among all of them. The research questions and propositions should logically flow from the case definition of rural women and built environments that promote physical activity. Table 3 gives further details of the data collection, analysis and dissemination process.

Table 3. Example of process for conducting explanatory case study research

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<th>Phase one</th>
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<tr>
<td>■ Obtain preliminary Institutional Review Board approval</td>
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<td>■ Engage communities, solicit feedback on study from community informants</td>
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<tr>
<td>■ Develop research questions and state propositions</td>
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<tr>
<td>■ Determine boundaries of study and unit of analysis</td>
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<tr>
<td>■ Outline protocol</td>
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<tr>
<td>■ Determine sources of data</td>
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<td>■ Establish criteria to interpret findings</td>
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<th>Phase two</th>
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<tr>
<td>■ Recruit focus group and individual interview participants</td>
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<td>■ Identify and reserve sites for focus groups</td>
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<td>■ Develop question route and conduct focus groups</td>
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<th>Phase three</th>
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<tr>
<td>■ Conduct individual interviews with village council members</td>
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<td>■ Complete the community windshield assessment (eg trails, sidewalks, school buildings)</td>
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<tr>
<td>■ Complete artifact collection (policies, council minutes etc)</td>
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<tr>
<td>■ Analyse data</td>
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<tr>
<td>■ Reconnect with community (confirmability)</td>
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<td>■ Audit by research data experts</td>
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<th>Phase four</th>
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<tr>
<td>■ Disseminate findings</td>
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**Criteria for interpreting findings**
Research design, as presented by Yin (2003b), includes establishing criteria for interpreting a study’s findings. Prior to initiation of data collection, establishment of criteria is completed by outlining theoretical propositions or rival
explanations. These, along with case descriptions, are criteria that interact with analysis of the data (Yin 2003a). Analytic techniques, such as pattern-matching, explanation-building, time-series analysis and logic models, are used with the criteria to develop internal and external validity of the findings. In case study, the goal of analysis is to establish inferences about the case, which link the data to the propositions or connecting data. During data collection and analysis, with guidance by the propositions, patterns are identified. Pattern-matching is the chosen analytical technique for the planned case study. The pattern-matching process, a technique where multiple sources of data contribute to similar phenomena, guides the analysis and gives direction (Yin 2003a). Generally, this linking of patterns occurs during the analysis phase after identification of patterns in the data.

**Method**

Case study research views the case/unit as central and collects multiple forms of data supporting the researcher’s assertions. Zucker (2001) identifies case study research for nurses as a method that centralises the patient in the process. Method is not a type of data collection for case study. Since the unit of analysis is central to case study research, the researcher is not the focus. This shift in focus empowers the participant to provide a holistic view of the situation (through multiple data sources), and to interact with the researcher in the study’s evolution, adding credibility to the outcomes. Grounding the case study in critical-feminism and adhering to a comprehensive, holistic outcome assists the researcher in maintaining a sense of context in this systematic form of inquiry.

**Protocol**

Maintaining a well-organised process creates a systematic inquiry and is central to the method. Defining the design creates the plan and delineating the protocol identifies the process for the researcher’s work. The researcher who uses case study methodology organises the process of the study meticulously by preparing a protocol. Protocols do not dictate results; they provide a guided opportunity for discovery.

Based on the design and definition of case/unit, the researcher outlines the
protocol (for example, Yin 2003a). This outline includes:
- a summary of data sources (for example, names and contacts for each source)
- a thorough review of all elements of the case, including the theoretical framework and relevant literature
- a description of process for reporting, which delineates major headings
- a list of pertinent reading materials (for example, case studies, books and articles).

A defined unit and an outlined structure are essential in directing the novice researcher.

This method fits the planned study due to the need for a systematic evaluation of all evidence from two rural communities relating to rural women’s experiences with physical activity and built environments as they exist. Another form of inquiry would fail to display the complex nature of living in rural communities (context), and would fail to deal with multiple sources of data, thereby interfering with identifying the role of rural women and the opportunity for emancipation.

**Sources of data**

Stake (2000) and Yin (2003b) concur that multiple sources of information within the real-life context generates data that is comprehensive and rich. Yin (2003b) identifies six sources of evidence: documentation, archival records, interviews, direct observations, participation observation, and physical artifacts. Each of these sources of data has benefits and detriments, but when used together they diminish the weaknesses and strengthen the case study outcome.

Documentation is stable, unobtrusive, exact, and has broad coverage (Yin 2003a). Weaknesses of documentation include difficulty with access, biased researcher selection, and biases of those reporting. Thus, the researcher must monitor potential weaknesses. Documentation sources include the collection of letters, announcements, agendas and meeting minutes from groups (community councils, for example). The researcher will collect and analyse community council minutes regarding the maintenance, construction and planning of built environments.
Archival data includes computer files and records. Yin (2003b) identifies service records, organisational records, maps and charts, lists of names, survey data, and personal records. The planned study includes maps and charts of the communities’ built environments. The archival records will visually support the understandings gleaned from evidence and will be a substantial area of data for the planned study.

Interviews are the backbone of data for case study research. The interview for case study research focuses directly on the topic of the study and may influence direction for inferences. The areas to be mindful of include biased questioning, response bias and recall of inaccuracies (Yin 2003a). The planned study includes focus group interviews with rural women and individual interviews with members of the community councils. There will be three focus groups with six to eight rural women held in the identified communities. The open-ended interview questions are adapted from Eyler and Vest’s (2002) study, expanded to focus on potential policy changes for rural built environments. The researcher will use Krueger and Casey’s (2000) approaches to focus groups.

Direct observation, as evidence, describes the context (built environments within two rural communities) and brings reality to the study. Yin (2003b) indicates that the weaknesses of this method are time-consumption, cost and the impact of ‘being watched’, which may influence normal activity. Within the context of the planned study, observation will include location, frequency of use, interactions within the context and the structure of the built environment.

Participant observation occurs when the researcher is no longer just directly observing but becomes a participant in the situation (Yin 2003a). This source has the additional strength of increasing insightful interpretation of the situation, with the weakness of potential bias due to the interaction (Yin 2003a). Both methods of observation will occur while attending community events (for example, meetings or health fairs) and will generate field notes for the planned study, which become part of the collected data.

The final data source is physical artifacts, which may include a technological device, a tool, art or physical evidence (Yin 2003a). These sources may provide insight into the culture or operations within the two communities; however,
selection by the researcher may bias them. A study can come alive with pictures, devices and other relevant artifacts, which help communicate the results to the lay public and policy makers. In the planned study, the researcher will ask participants for advice about appropriate artifacts including their rationale. Having the participants direct the process is consistent with empowerment of participants and reduces the researcher’s bias, adding rigour to the study.

Data analysis
Data analysis for case study depends on the data sources. The researcher will review data to support or dispute the propositions. For analysis, Stake (2000) refers to triangulation and comparisons, whereas Yin (2003b) focuses on pattern-matching, explanation-building, time-series analysis and the use of logic models. Maintaining an organised filing system for the data is crucial and facilitates comprehensive data analysis. For the planned case study, qualitative data sources as previously identified will be analysed individually and then collaboratively as a case to determine relevant ideas and commonalities that move towards categories and coded themes (Boyatzis 1998, Miles and Huberman 1994). A description of findings will be composed using emergent patterns. The case will be viewed in the context of an ecologic model. To ensure credibility, the team’s qualitative expert will audit the process and findings for logical flow towards the study’s outcomes.

Researchers will analyse field notes from windshield assessments (e.g. observation and documentation of the community facilities, infrastructure, and resources, by driving through the community), archival data, and physical evidence from assessed miles of sidewalks, and trails, which identifies and quantifies the condition of built environments and their maintenance status based on well-established criteria (Williams et al 2005). In addition, assessments will include investigation of potential sources of built environment for indoor physical activity, such as the availability of a facility that is open to the public. To augment the field notes from windshield assessments, archived data will include maps, sketches and pictures of the built environment resources. The status of the built environment will be determined and presented through these methods to village council members. Their feedback will be requested on the study findings during the presentation.
Lastly, case analysis will include reviewing the description of themes and information from the archived materials and physical artifacts to identify patterns and connections between them. This pattern-matching between data sources establishes internal validity (Yin 2003a). The qualitative experts and the principle investigator/researcher will review results independently and arrive at a consensus. The conception of generalisations resulting from the combined data sources will include assertions based on contextual elements of the ecologic model, case development and policy guidelines for built environment in rural communities.

**Implications for nursing research**

Case study is particularly appropriate for population-based nursing practice and research. In the planned study, this research approach supports community engagement, empowers minorities and utilises multiple data sources, increasing comprehensiveness and rigour. This all-encompassing holistic approach generates conclusions that fit the situation, supporting future structural and policy change and reassessment.

**Conclusion**

In conclusion, this proposed case study can be grounded in critical feminism, which empowers and respects participants through involvement in decision-making processes and sharing of perceptions. The design for case study may include research questions, aims, purpose/propositions, units of analysis, singular/multiple data sources, and criteria for interpreting findings. A protocol is central to the method. The nurse doing population research will find that case study supports community engagement and, due to its holistic approach, is ideal for the nurse approaching research in a global context.

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