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Developing a framework for critiquing health research

Kay Caldwell,

BSc, PhD, RN, RNT, PGCHE, ILTM, Head of the Institute of Nursing and Midwifery, School of Health and Social Sciences, Middlesex University

Lynne Henshaw,

BA, MPhil, RN, RGN, RNT, CertED, Senior Lecturer in Nursing, School of Health and Social Sciences, Middlesex University

Gina Taylor,

BA, MSc, PGDip, RN, DN, CertED (FE), Senior Lecturer in Health Studies, School of Health and Social Sciences, Middlesex University

Abstract

A new framework for critiquing health-related research is presented in this article. More commonly used existing frameworks tend to have been formulated within the quantitative research paradigm. While frameworks for critiquing qualitative research exist, they are often complex and more suited to the needs of students engaged in advanced levels of study. The framework presented in this article addresses both quantitative and qualitative research within one list of questions. It is argued that this assists the 'novice' student of nursing and health-related research with learning about the two approaches to research by giving consideration to aspects of the research process that are common to both approaches and also that differ between quantitative and qualitative research.

Key words

Research critique; critique framework; health research.

Introduction

When undertaking an undergraduate programme in health related studies, as in many other academic disciplines, students are required to demonstrate the ability to read, understand and critique research reports.

Health research was at one time guided by the 'medical model'. However, though this model remains influential, Polgar & Thomas (2000) suggest that there have been changes in the role and status of other health professionals that have brought different perspectives, and require different approaches to research. A more holistic approach now influences how health care is conceptualized, and how research is conducted. The methodology of social research has become an accepted part of health research.

Green and Thorogood (2004) state that "*health research includes any study addressing understandings of human health, health behaviour or health services, whatever the disciplinary starting point*" (p5). They further suggest that health research may expand

knowledge of society and health, or address an existing health care problem. Undergraduates of health related studies therefore have to consider health research in its broadest sense.

A common method of assessing understanding both of the subject area and the research methodologies utilized within that subject area is the presentation of a detailed critique of a piece of published research. Our experience in teaching students across a range of programmes in Nursing, Health Sciences/Studies, Health Promotion and Health Policy programmes has taught us how difficult many of our students find this task. With the help of funding from the Learning Development Unit we undertook a project to develop, implement and evaluate a research critique framework that students could use as a guide.

This article analyses the content of frameworks that are commonly used to critique quantitative research and frameworks that are commonly used to critique qualitative research and then presents a single framework that addresses both research approaches. This new framework is currently being used to assist teaching and learning activities relating to the critical appraisal of published research. As such, it is still in the developmental stage and as teachers we continue to reflect on the application of this framework to our teaching. Feedback from students is essential to this development and the article presents evaluations from students who have been involved in learning activities during the early developmental stage of the framework. This evaluation is continuing and we would also welcome comments from our colleagues.

The need for a research critique framework

The need for able and competent health care practitioners is self-evident. One way of ensuring competence is through evidence based practice and health professionals are expected to be intelligent consumers of research, and this entails the ability to read, understand and apply published research (Murdaugh *et al*, 1981). A change of culture arose

following the move of colleges of nursing into the further and higher education sector, resulting in an educational culture where critical enquiry and evidence-based practice is accorded greater priority (Benton, 1999). Most students are introduced to research methods and critical appraisal during their undergraduate education, or preparation for professional practice. Yet McCaughan *et al* (2002) report that qualified nurses reported problems in interpreting and using research. MacAuley *et al* (1998) highlighted how GPs who had been introduced to a model of critical reading were shown to have applied a more appropriate appraisal to studies than those who relied on critical appraisal skills acquired previously. Whilst literature in relation to the ability to critically appraise research is abundant in relation to nursing and to a lesser degree in medicine, there is an emerging body of evidence in relation to other health care professionals. Chalen *et al* (1996) identified several barriers to research-mindedness in radiographers, including a lack of knowledge of research methodologies. Domholdt *et al* (1994) noted that this group had particular difficulty in identifying concerns with construct validity.

Work in the field of health and health care is multi-disciplinary and involves a variety of approaches to research. Further the range of such research is wide, from concerns with the relationship between the health needs of a population to aspects of the provision of health services (Bowling, 2002). Government policy and professional guidance insist that professional practice should be based on evidence (Gomm & Davies, 2000). While Pearson & Craig (2002) elaborate on the need for nursing practice to be evidence-based, the need for evidence-based health promotion has been highlighted by Perkins, Simnett & Wright (1999), who also point out that the achievement of the targets of 'Our Healthier Nation' depend on the commissioning and implementation of effective health promotion programmes.

Given the primacy placed on the use of evidence in the field of health and health care, it is important that students are enabled to critique published research in order to determine the usefulness of that research in their chosen field of work. By 'critique' we mean the ability to critically appraise published research by identifying the strengths and weaknesses of the research and forming judgements concerning its overall quality and applicability.

Research in the fields of nursing, health studies, health promotion and health policy can be of a quantitative or qualitative nature: both research approaches provide valuable information for the disciplines and often complement each other. As such, students are required to read and critically review quantitative and qualitative studies. However, many of the available frameworks for conducting a critical review are written within the quantitative paradigm (e.g. Benton & Cormack, 2000; Polgar & Thomas, 2000). There has been a tendency to evaluate qualitative research against criteria appropriate

to quantitative research (Sandelowski, 1986). This can result in students attempting to analyse qualitative research within a quantitative framework and thus can lead to unjustified criticism, for example, quantitative frameworks for critique will direct students to raise questions concerning reliability and validity, rather than confirmability, dependability, credibility and transferability. These activities, which may lead to students appropriating the language of quantitative research when critiquing qualitative research, can only serve to perpetuate the view of qualitative research as a 'soft science' and detract from its value as a research approach in its own right that aims to acquire information that is different from that acquired by quantitative research (Leininger, 1994).

There has been considerable debate concerning whether quantitative and qualitative research can be assessed using the same criteria (Mays & Pope, 2000). While there are many criteria that will be common to both research approaches such as the identification of an appropriate question, the choice of an appropriate research design, the conduct of a thorough and relevant literature review, there are also discrete areas of difference. For example, variables are not always given operational definitions in qualitative research as sometimes the aim of the research is to seek definitions of the concepts from the viewpoint of the informants.

Various frameworks were reviewed and the common features that relate to quantitative and qualitative research were identified. In general guidelines tend to reflect the philosophies of the respective approaches in that guidelines for quantitative research tend to be in the form of checklists, whereas guidelines for qualitative research tend to be more discursive.

Frameworks for critiquing quantitative research

The framework presented by Sajiwandani (1996) provides a useful checklist covering points that are appropriate for critiquing quantitative research relevant to nursing and health care students and provides an explanation and rationale for critique. Polgar & Thomas (2000) also provide guidelines specific to the critical evaluation of quantitative research papers. Benton & Cormack (2000) offer criteria for critical evaluation of research but do not state that their criteria are intended for use with a particular research approach, however, the criteria are written within the quantitative framework in so far as they refer to hypothesis, operational definitions, validity and reliability of any instruments or questionnaires. Treece & Treece's (1986) classic text offers a comprehensive list of questions to aid critical evaluation, but again it is written within the quantitative paradigm.

The website of cybernurse (http://www.cybernurse.org.uk/research/Reading_and_Critiquing_Research.htm) offers a framework for the

areas that should be considered when critiquing a research report. There is no indication regarding which research approach this framework can be used for, but in terms of data analysis only statistical analysis is mentioned, yet hypotheses are not mentioned. In addition, there are many important omissions, for example, research design, recommendations, limitations.

While considering a range of frameworks focusing on quantitative research the areas that appeared most consistently were in relation to the research design; hypothesis, operational definitions, population and sampling, sampling methods, validity and reliability of data collection, data analysis and generalizability. However, there were a plethora of critique frameworks that focused on very specific designs, rather than on generic quantitative research, and these of necessity had far more detailed guidelines for critique. The website of the University of Wales (www.uwcm.ac.uk/library/critical_appraisal/forms) offers different frameworks for appraising systematic reviews; randomised control trials; trials without randomisation; cohort (longitudinal) studies; case-control studies and cross-sectional studies. This in itself pre-supposes a level of research design awareness that is likely not to be evident in undergraduate students during the early stages of their programmes of study.

While there appears to be some degree of consensus concerning the areas that should be addressed when critiquing quantitative research the situation is less clear when it comes to qualitative research.

Frameworks for critiquing qualitative research

Hammersley (1992), writing specifically concerning ethnography, provides criteria for assessing ethnographic studies. Questions are raised concerning the extent to which new theory is produced, how far is the theory developed and how novel are the claims made. He also refers to the credibility and transferability of the findings, as well as the influence of the researcher on the findings. Mays & Pope (2000) refer to the increase in interest in assessing the quality of qualitative research and, drawing on the earlier work of Hammersley (1992), identify two broad criteria: validity and relevance. These authors acknowledge that these concepts can also be used when assessing the quality of quantitative research, but when used in relation to qualitative research they need to be operationalized differently to reflect the distinctive goals of qualitative research.

The website of the Public Health Resource Unit (<http://www.phru.nhs.uk/~casp/qualitat.htm>) presents a framework for critically appraising qualitative research built around ten questions, with supporting detailed guidelines. Areas that are specific to qualitative research

include the relationship between the researcher and the participants and rigour in relation to data analysis. Greenhalgh & Taylor (1997) provide an overview of the nature of qualitative research and again suggest a framework for critique based on nine questions with supporting guidance. In terms of being specific to qualitative research, the authors refer to the need to acknowledge the researcher's perspective, a detailed description of methods used for data collection, quality control measures in data analysis and the credibility of the results and the transferability of the findings to other settings. Forchuk & Roberts (1993) claim that there is a paucity of guidelines for examining qualitative work and provide a framework for this purpose, which is aimed at undergraduate nurses and other health professionals. The authors cover Leininger's (1990) criteria for rigour, but with minimal explanation. Overall the guidelines are relevant and useful for qualitative studies, but the journal may not be readily accessible to all health studies students.

Highly specialized texts exist that offer advice, discussion and debate, concerning the evaluation of qualitative research (Leininger, 1994; Morse & Field, 1996; Kuzel & Engel, 2001), and, *inter alia*, refer to issues like the context of the research and the need for an audit trail.

Frameworks for critiquing both quantitative and qualitative research

Gomm, Needham & Bullman (2000) provide questions to be asked concerning quantitative research, in terms of three sections: Questions to ask about data collection instruments; questions to ask about experiments; questions to ask about surveys, case finding (or 'clinical epidemiological') studies and case control studies. They also provide questions to ask about qualitative research in which attention is drawn to the setting of the research, the researcher's role in the research and the relationship of the study to other research in the field.

Stevens, Schade, Chalk & Slevin (1993) provide a chapter on evaluating research in a book aimed at health care professionals. This is perhaps one of the most misleading guides in terms of evaluating qualitative research. A framework for research evaluation is provided and at the beginning it is acknowledged that qualitative research is not necessarily performed and presented in the same format as quantitative research. It is further stated that, in the light of this, reference will also be made to qualitative research. Though reference is made to qualitative studies, it is inadequate and sometimes misleading, for example, in the methods section reference is made to validity and reliability in measuring instruments, but qualitative methods are ignored. Further, in the results section qualitative findings are not mentioned.

Nieswiadomy's (1998) guidelines for critique appear to follow the quantitative paradigm, however, she does stress that not all studies require a hypothesis and that "*studies of a purely descriptive nature*" (p342) may not contain hypotheses, in which case research questions may be used. Also, under the section headed 'Research Design', Nieswiadomy states that quantitative designs and qualitative designs are evaluated using different criteria. However, limited advice is offered to guide qualitative critique. Valente (2003) provides a framework that mentions quantitative and qualitative research in some sections, for example, method, but refers solely to quantitative in others, for example, analysis. Overall, the framework is heavily biased towards quantitative research, and when both approaches are discussed it is not clear which approach is being addressed.

The website of the University of Wales College of Medicine (www.uwcm.ac.uk/library/critical_appraisal/forms) provides a series of guides on critical appraisal of research studies, all taking the format of a table that identifies a question and directs the reader to answer by ticking 'yes', 'no' or 'can't tell', but with no guidance as to what should be considered when answering the question. The questions are focused towards critically appraising the research for the purpose of ascertaining its relevance to practice, and assumes a high level of knowledge of research methods in order to be able to answer the questions, so would be difficult for undergraduates to use effectively.

Parahoo (1997) takes account of both quantitative and qualitative approaches to research and provides a list of broad headings that encompass both approaches. The guidelines are comprehensive in terms of quantitative research, but less so for qualitative research. Each point for critique initially addresses quantitative strategies and is followed by a paragraph suggesting a different approach for qualitative work. For example, Parahoo states "*in qualitative studies, researchers may not want to be influenced by previous research. They should, however, give a rationale and make reference to the relevant literature*" (p363). However, qualitative research is addressed with less rigour than quantitative research and the less discerning student may well confuse the two approaches. The guidelines fail to clearly set out the different criteria for each strategy, for example reliability and validity are discussed, but confirmability, dependability, credibility and transferability are not referred to. However, attention is also drawn to the need for rigour and an audit trail.

In a book written for nurses, LoBiondo-Wood & Haber (1994) provide two separate chapters for quantitative and qualitative critique. Dealing with the two strategies in different chapters could be difficult for the novice student who is still trying to internalize the difference between the two approaches. However, both are dealt

with thoroughly and do provide useful guidelines for the more advanced students. They make useful cross-references to other chapters in the book. Hek (1996) highlights the importance of critical evaluation as a means by which nurses can practice knowledgeably, and stresses the importance of developing critical evaluation skills, recommending a six-stage process. Quantitative and qualitative research are both addressed within a specific guide to the sections of the research that should be considered, but the complex integration of quantitative and qualitative critique might be confusing to the novice student. Some essential components, such as setting, population and sample are omitted. Further, the guide is presented in textual format and so some detail can be lost.

Burns & Grove (2001) offer frameworks for both quantitative and qualitative research in nursing, acknowledging the need for differing approaches to the critique of different types of studies. While their framework for quantitative research includes the standard topics like research objectives, questions or hypotheses, the definition of variables, the identification of independent and dependent variables, validity of instruments, statistical procedures, when it comes to qualitative research, other questions are raised. Burns and Grove thus refer to 'descriptive vividness', looking for clarity and factual accuracy of the researcher's account of the study. The context must be clear as data are context-specific. Rigour in qualitative research demands a clear account of the study elements, e.g. the philosophy, the role of the researcher, the process. Auditability and a decision trail are also required and any theory derived from the study must reflect the data. DePoy & Gitlin (1998) provide 'guiding questions' to critically evaluate quantitative and qualitative research studies. They present two adjacent lists, headed 'experimental-type' and 'naturalistic inquiry', each with very similar questions except for the entry for quantitative research concerning validity and reliability, where its qualitative counterpart refers to trustworthiness.

Polit & Hungler (1999) offer separate guidelines for quantitative research and for qualitative research. These are thorough and complex and are presented in sections, for example, guidelines for critiquing research problems, research questions and hypotheses; guidelines for critiquing research literature reviews, and so on. The guidelines for quantitative research vary little from those already reviewed. The guidelines for qualitative research include reference to the research tradition within which the study is carried out and highlight that the research question and methodology should be consistent with the research tradition. Again, an accurate description of the research design is required, as is trustworthiness of the data. Credibility, transferability, dependability and confirmability are included in the guidelines. In terms of data analysis, Polit and Hungler state that the themes

should represent the narratives and there should be evidence of accuracy of the researcher’s analysis and that the context of the research should be clear. Polit and Hungler’s framework for critiquing research is also available on a web-site (<http://www.sonoma.edu/users/n/nolan/n400/critique.htm>). This is a comprehensive framework, but complex and not easily accessible for novices.

Development of a new framework

Having reviewed a range of published research critique frameworks, the first step was to identify the common

features (Table 1). Following this the strengths of individual research critique frameworks were identified. This enabled us to develop a framework that had areas that were common to both quantitative and qualitative approaches, and areas that were specific to each (Figure 1). To support the diagrammatic framework guidelines are available and provide the teacher and the student with an extended explanation of each item. Examples of these guidelines are as follows:

Item in Research Critique

Framework

Guideline

Is the literature review comprehensive and up-to-date?

The literature review should reflect the current state of knowledge relevant to the study and identify any gaps for conflicts. It should include key or classic studies on the topic as well as up to date literature. There should be a balance between primary and secondary sources.

Quantitative:

Is the sample adequately described and reflective of population?

Both the method of sampling and the size of the sample should be stated so that the reader can judge whether the sample is representative of the population and sufficiently large to eliminate bias.

Qualitative:

Is the selection of participants described and the sampling method identified?

Informants are selected for their relevant knowledge or experience. Representativeness is not a criteria and purposive sampling is often used. Sample size may be determined through saturation.

Is the conclusion comprehensive?

Conclusions must be supported by the findings. The researcher should identify any limitations to the study. There may also be recommendations for further research or, if appropriate, implications for practice in the relevant field.

Table 1: Common features of research critique frameworks

Quantitative

Qualitative

Research design

Philosophical background

Experimental hypothesis

Research design

Operational definitions

Concepts

Population

Context

Sample

Sample

Sampling

Sampling

Validity/reliability of data collection

Auditability of data collection

Data analysis

Credibility/confirmability of data analysis

Generalizability

Transferability



Figure 1: - Research critique framework

Use of the framework

The framework is designed to be used both as a teaching tool and as an aid to assessment. One of the motivating factors for producing a framework was to provide clarity and to ensure fairness for those students undertaking a critical review of a research paper for assessment purposes. During our experiences of helping students to perform such critical review we had found that some students had been unable to discriminate between those questions that are appropriate to ask of quantitative research and those that are relevant to qualitative research. We hoped that by placing the questions that are appropriate for the respective research approaches in one single framework we would be able to facilitate the clarification of some of the theoretical positions that inform the respective research approaches and thus, in turn, aid understanding of the need to pose different questions. Thus, the framework can also be used in the classroom for facilitating learning, and as a tool for group activity.

Experience has demonstrated that it is the practice of critically reviewing a research report that is valuable in the learning process. Small group work provides the student with opportunities for rewarding engagements (Quinn, 1995), it allows students to work independently and to discuss and clarify learning. In small groups students have been provided with both quantitative and qualitative research papers and have used the framework and guidelines to produce their review. Feedback of the review to the larger group allows further discussion and development of knowledge and understanding.

The critique framework was used in teaching sessions with two groups of under-graduate nursing and health studies students and one small group of post-graduate students. Nineteen students completed an evaluation form. The numbers of students responding to particular questions on a 0 – 5 scale are shown in Table 2. Students were also asked two open questions:

- What did you like most about the framework?
- What did you like least about the framework?

Table 2: Evaluation of the Framework for Research Critique

	0	1	2	3	4	5
How easy was the framework to use? 0 = not at all easy; 5 = very easy			2	5	5	7
How useful is it to have a framework covering both quantitative and qualitative research? 0 = not at all useful; 5 = very useful				1	7	11
As a learning tool, to what extent did the framework help you to appreciate the features that: a) are common to all research? 0 = not at all; 5 = to a great extent				4	8	7
b) are specific to quantitative research?				3	13	3
c) are specific to qualitative research?				5	8	6
To what extent did the framework help you to carry out a critique of a piece of research? 0 = not at all; 5 = to a great extent				2	8	9

What did you like most about the framework?

In response to the first question, the responses can be grouped under two headings: ease of use and practical application.

Ease of use

Students liked the presentation of the framework and described it as straightforward, succinct and precise. The fact that it fits on one page was pleasing to the students and there were also comments relating to its simplicity and brevity.

Practical application

Students found the framework easy to follow and understand, describing it as very easy and very helpful. They described the structure and the questions as good and stated that the framework will help them to advance their skills relating to the research process and methods. It was also felt that the framework provides a useful guide for critiquing research.

What did you like least about the framework?

Some comments suggested that the framework was too short and could be more elaborate, but eight students stated that there was nothing they disliked about it.

Discussion

We recognise that the comments presented here represent the contributions of a small number of self-selecting students and there is a need for a more systematic approach to the evaluation of this framework. This will be undertaken as the framework continues to be used in classroom activities with students. However, the current contributions from students do provide some early indications of the potential value of the framework.

Overall, the students found the framework easy to use and useful in terms of covering both quantitative and qualitative research and helpful when carrying out a critique of published research. Student responses to the framework were largely positive, suggesting that it is a

useful tool in aiding learning about research and in undertaking a research critique. The undergraduate students who used the framework are required to critique a piece of published research for their assignment in their research methods module and it is evident that they felt that the framework would help them with this task.

Students responded favourably to the questions relating to the features that are common to all research, quantitative and qualitative research. However, in this brief evaluation it was not possible to explore this further, for example, by asking them why their responses were positive or what in particular they found helpful. This will form part of further evaluation as the framework is used more widely.

Unlike some frameworks for research critique, this framework gives equal weight to both quantitative and qualitative research and uses the language of both paradigms. In this way, students do not attempt to critique qualitative research using a framework and terms originally designed for quantitative research.

While students could be referred to two separate frameworks, and students continue to be able to choose to use separate frameworks, we believe that the incorporation of the two approaches into one framework serves to assist learning and reinforces the differences between quantitative and qualitative research for the 'novice' student of research methods. Having acquired understanding at an introductory level, advanced frameworks are available for both research approaches when, and if, students require greater depth at a more advanced level of study.

Conclusion

Though the framework and guidelines were initially designed for students working at both level two and level three, it has also been found valuable with more advanced students. Those undertaking masters level study are frequently given the more complex task of writing a critical literature review in preparation for a research proposal or research report. Those students who have not undertaken academic study for some time find this daunting, and often request revision. The framework has proved to be a useful tool in this activity.

For assessment at level two and three, students are frequently required to critically review a paper of their choice. Provision of the framework, with the assessment guidelines, provides a direction for all students. The inclusion of both strategies ensures that whatever the choice of paper all students have guidelines with which to work.

The framework, then, is of value in both teaching and assessment at level two and three, and is also a potentially useful teaching tool for masters level

students. It can be used as a teaching tool and displayed on an overhead projector or on PowerPoint. It can also be easily copied as a one page handout for students to work with in the classroom or to take away for study. Further use of the framework is required, but the intention is to place it on WebCT, with the guidelines available as 'clickable links'. As such, it will also serve as a revision aid and will allow students to test their own knowledge, clicking on those areas where they feel they need further explanation. The next stage is to facilitate a more systematic evaluation of this framework: we also welcome comments from our colleagues.

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Kay Caldwell
Head of the Institute of Nursing and Midwifery
School of Health and Social Sciences
Middlesex University
Archway Campus
Furnival Building
10 Highgate Hill
London
N19 5LW
UK

Tel: +44 (0)208 411 6458
Email: k.caldwell@mdx.ac.uk

Lynne Henshaw
Senior Lecturer in Nursing
School of Health and Social Sciences
Middlesex University
Queensway
Enfield,
EN3 4SA
UK.

Tel: +44 (0)208 411 6474
Email: l.henshaw@mdx.ac.uk

Gina Taylor
Senior Lecturer in Health Studies
School of Health and Social Sciences
Middlesex University
Queensway
Enfield,
EN3 4SA
UK.

Tel: +44 (0)208 411 5383
Email: g.taylor@mdx.ac.uk