

Understanding research paradigms in nursing research

The example of postoperative pain management

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... the paradigm of a profession not only concerns the content of the professional knowledge, but also the process by which the knowledge is produced.

— Roberts and Taylor (page 12)¹

NURSING HAS EVOLVED as a distinct discipline through the development of clinical knowledge and skills, the application of knowledge from other disciplines and nursing research and inquiry. The clinical practice of nursing deals with the subjective condition of individual patients. In many instances, this means that research to improve the clinical care of patients must address individual preferences and environmental variables that are not amenable to simple quantitative analysis. Nursing has developed research methods to tackle these complex questions. This article compares the relative merits of the major research paradigms in nursing in relation to one such complex area of nursing practice: postoperative pain management.

Defining the research paradigms

Quantitative research is the dominant paradigm in nursing research and knowledge,¹ as it is in medicine and science generally. In quantitative research, research topics are reduced as far as possible to simple questions with quantifiable answers. Results are analysed to produce quantifiable, statistically significant data.³ These findings confirm or dispute (with a degree of certainty) cause-and-effect relationships between (for instance) drug doses and specific clinical signs and symptoms, or between length of hospital stay and the incidence of readmission. The results of quantitative research are intended to be capable of generalisation — that is, the research method attempts to identify objective truth applicable in all objectively



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Synopsis

- ◆ The dominant research paradigm in nursing is quantitative research, in which research questions are reduced to a form that can be answered in terms of quantitative data capable of objective measurement.
- ◆ Qualitative research and emancipatory research are other valid and useful research methods in nursing.
- ◆ Qualitative research focuses on the words and behaviour of the research subjects to discover subjective truths.
- ◆ Emancipatory research involves both the researcher and those people being studied in planning, carrying out and acting upon research findings so that the research becomes a resource to improve standards.
- ◆ Quantitative research into pain cannot address the subjective nature of the experience of pain and does not directly influence clinical practice.
- ◆ Qualitative research gathers meaningful information about the experience of pain and pain management, but again does not directly influence clinical practice.
- ◆ Emancipatory research influences clinical practice directly by enrolling nurses and patients in the design and execution of the research intervention.
- ◆ The influence exerted by research on nursing knowledge and practice is directly related to the methodology used, its relevance to the nature of the problem, and the applicability of the knowledge developed to clinical practice.

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similar situations. The quantitative research paradigm assumes the existence of an objective reality in which the known is independent of the knower.⁴

Qualitative research “focuses on uncovering and understanding the meaning of lived experiences”.² The unit of analysis is the subjects’ words or behaviour, and the research process deals with subjective rather than objective realities.^{5,6} Qualitative research can address questions such as why patients may have difficulty complying with a drug regimen, or why patients may seek longer or shorter stays in hospital. The results generated by qualitative research are likely to illuminate multiple subjective truths, rather than a singular “right answer”, and therefore may not be capable of generalisation.

Emancipatory research is a relatively new research paradigm

in nursing research.⁷ It was developed not simply because of a pragmatic wish for more varied data, but also to address criticisms of the philosophies underlying both quantitative and qualitative approaches. It involves both the researcher and those people being studied in planning, carrying out and acting upon research findings, so that the research becomes a resource to improve standards.⁸ It is concerned with attempting to implement interventions to solve problems in a real world context.⁶ This methodology recognises the value of “methodological triangulation” and uses methods from the quantitative and qualitative paradigms.⁸

Emancipatory research is increasingly being seen by nurses as an approach that has much to offer because they can use it to analyse problems, devise programs of action to solve problems or improve standards, carry out and evaluate plans, and learn more about research in the process. These methods are seen as “emancipatory” as they allow nurses to take back the authority for clarifying their own roles and creating the conditions for effective practice themselves.

Aim of nursing research

A prime aim of nursing research is to influence and improve practice.⁹ Each paradigm has distinct methods and a conceptual framework for addressing research questions, with advantages and disadvantages depending on the research question. This can be illustrated by examining the influence on nursing practice of nursing research on postoperative pain management. I shall examine three studies:

1. To evaluate methods of pain management, MacLellan conducted a quantitative, non-experimental study that correlated the prescribing and administration of postoperative analgesia with levels of pain documented in patients’ medical charts in the first five days after surgery.¹⁰
2. Carr and Thomas conducted a qualitative research study of patients’ expectations and experiences of pain and of factors reported by patients experiencing pain as contributing to the effective/ineffective management of their pain.¹¹
3. Hastings used an emancipatory research design to introduce structured pain assessment on a surgical ward, with the aim of improving pain control, and subsequently patients’ recovery and satisfaction with care.¹²

Defining the research problem

Many studies show that pain management after surgery is inadequate and that patients still suffer moderate to severe pain, even though the innovations and tools to effectively manage pain exist.^{9,13} Failure to relieve pain is ethically unacceptable; therefore, research in this area is significant to the development of nursing knowledge and safe clinical practice.

Pain is an extremely difficult concept to define, describe and assess due to the individual nature of the experience.⁹ One

individual can never directly experience the pain of another. Many factors can affect the experience of postoperative pain, including illness severity, age, gender, ethnicity, experience, and the knowledge and attitudes of both staff and patients.¹⁴ Evaluating the influences of these factors on pain experience is difficult and presents many methodological problems.

The quantitative approach to pain research

Quantitative research into pain presents findings with a degree of artificiality (eg, such as the arbitrary nature of pain scales), which lack relevance when applied to the subjective experience of patients and staff.¹⁵ Additionally, ethical constraints prevent the manipulation of variables to determine the cause and effect of inadequacies in pain management.

Daly (as cited by Fox)¹⁵ argues that in quantitative research problems in treatment tend to be attributed to the intrusion of social factors. In an attempt to reduce the problem to a manageable research question, quantitative researchers either remove or “quantify” social factors by increasing the technicality of their procedures.¹⁵ In this paradigm, social factors are explained in the same way as biological and physiological phenomena, or they are disregarded altogether.⁸

The study by MacLellan was confined to verification of observable applications of pain management practices.¹⁰ Research with this sort of quantitative descriptive design is an effective way of acquiring and processing data to investigate relationships between variables when little is known about the subject in question.¹ This research provides data which can be researched by more exacting methods to generate theories to influence improvements in practice.¹ However, Dufault et al argue that there is already a wealth of empirical knowledge in the area of pain management which illustrates the inadequacies of pain management practices.¹³

MacLellan’s study provided evidence of the problems associated with the relief of postoperative pain. The study reviewed analgesic prescribing, analgesic administration and the documentation of pain by the retrospective review of randomly selected patients’ charts. MacLellan concluded that documentation of pain following surgery is poor and needs improvement, and that existing prescribing trends, particularly PRN (as required) prescribing, may be hindering good practice and the pre-emptive administration of analgesia.

Although the findings implicated both doctors and nurses as responsible for the unnecessary pain of patients, further research is needed to ascertain why PRN prescribing leads to undertreatment. Although it did not present solutions or produce improvements in practice, it did suggest that the solution to the problem of inadequate pain relief lies not so much in the development of new techniques, but in the better use of existing techniques.

Wilson-Thomas has suggested that nursing requires theories and research that are relevant to providing holistic care — something that quantitative data alone cannot provide.¹⁶ This is a methodological problem resulting in part from attempting to oversimplify the complex nature of pain management.

The qualitative approach to pain research

Pain perception is a complex subjective phenomenon, influenced by individuals' experiences as they interact with their environment.⁹ Carr and Thomas thought that in attempting to quantify and make objective what is a personal and subjective experience "the potential richness of data and insight into the lived experiences are ... lost".¹¹ They took a phenomenological approach to research to gain an understanding and insight into the factors that influence individuals' expectations and experiences of pain.⁵ (Phenomenology presents an interpretation of observed phenomena, without theory development, as represented by the informants' language and behaviour in in-depth interviews.) During an in-depth interview with patients, Carr and Thomas prompted patients with a visual analogue scale of pain scores and recorded their preoperative expectation of pain and their worst pain experienced in the five days after surgery. Details of analgesia were also recorded.

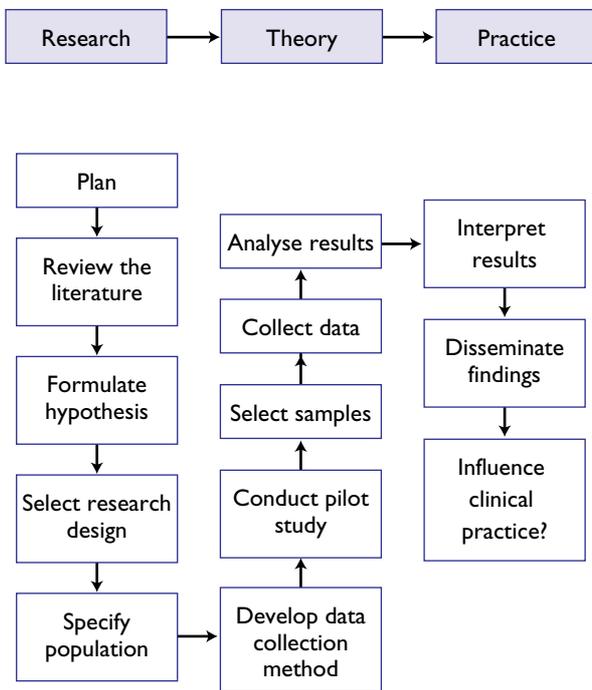
This allowed Carr and Thomas to identify focal meanings of pain perception and experience by describing and analysing patients' subjective experience of pain.¹¹

Insight into the patient's perspective on pain management confirmed that a key component of the successful management of patients' pain is an accurate assessment of the patient's situation. This assessment provides the foundation on which individualised pain management intervention can be based. These findings support previous studies, which report that the full potential of new pain technologies will never be realised unless research considers patients' perspectives and the environment within which these technologies are placed.¹⁷

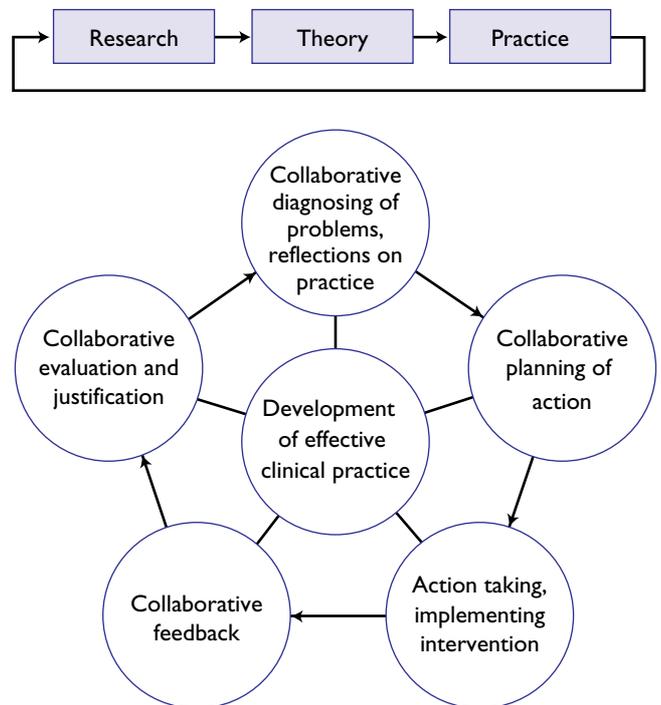
Issues of validity or "trustworthiness" concerning data collection and analysis are common criticisms of qualitative research raised by researchers who come from a quantitative perspective. It is argued that researchers' bias, views and expectations influence results.¹⁸ However, the goal of interpretive inquiry is to provide understanding of human experience and reality without developing theory or "truth".² Consequently, the transfer of credibility criteria, validity and reliability from the quantitative to the qualitative paradigm is not reasonable.⁵ Instead, the authenticity of qualitative research is determined not by mathematical formulae, but

A difference in methods

Traditional research



Emancipatory research



Both quantitative and qualitative research methods are traditional, linear methods of conducting research, in which clinical practice is the last thing to be affected by the research activity. Quantitative research attempts to determine with a degree of certainty the existence of an objective reality, one that can be generalised to (imposed on) the target population. Qualitative research stresses the socially constructed nature of reality and the situational constraints that shape inquiry, and thus the existence of an individual and subjective reality. Emancipatory research recognises the limitations and restrictions created by both approaches and attempts to emancipate individuals by empowering them with the authority to clarify their own roles and establish effective practice for themselves. Traditional research methods have led to the imposition of practice directions on the nursing profession; emancipatory research is in the hands of nursing practitioners.

through the adjudication of readers and fellow researchers. The essential premise of this process is that the qualitative researcher's report makes the research process adequately visible and auditable.

A qualitative account is true inasmuch as it accurately represents those features of the phenomena that it intends to describe or explain.

As such, qualitative research is not a direct guide to action to improve practice. However, it does expand knowledge and understanding of the issues involved. Qualitative findings can have an indirect influence on decisions and actions.

In contrast to quantitative research, the qualitative research of Carr and Thomas was effective in understanding the nature of the problems associated with the relief of postoperative pain and provided recommendations for improvements in practice. Clinical nursing knowledge was developed, but the recommendations require further research to evaluate their effectiveness before their implementation. Consequently, it is difficult to assess the direct influence on improving clinical practice, but it can be suggested that there is considerable indirect influence for change.

The emancipatory approach to pain research

The methodology of emancipatory or action research may be more successful in producing effective long-term change in practice. Hastings' project facilitated the introduction and evaluation of structured pain assessment in postoperative pain management.¹² Hastings considered the perspectives of staff, patients, and the relevant literature on pain, its nature and management. The consensus of staff and researcher was to develop a structured assessment tool, which could be individualised for each patient and modified for specialised departments. This concept was inferred from and supported by the research of MacLellan, and Carr and Thomas, although the development and implementation of such an innovation was outside the capabilities of their chosen methodologies.¹⁰⁻¹¹

The collaboration in planning, implementing and evaluating Hastings' research project engendered a high degree of commitment from staff because they had a tangible and important role in the development of clinical practice.⁶ The research empowered nurses to clarify their own roles and to establish the conditions for effective practice.⁷ Additionally, as it was conducted in a real world setting specific to their needs, acceptance of change in patient care was enhanced.⁸ Evaluation and justification for the interventions implemented in the research were derived from direct feedback from staff and patients.

Emancipatory research raises similar issues of validity as those raised in relation to qualitative studies, and similar arguments can be made in response to criticism. It could also be said that results are valid if the knowledge developed improves the practice for which the project was intended.⁶ Emancipatory research deals with real problems and people

in a specific working environment. Improvements in practice are evaluated from the feedback provided by all participants (researcher, staff and patients) involved in the action phase of the research (see diagram). This feedback becomes the stimulus for the next phase of the research cycle, which continues until effective practice interventions are developed to the satisfaction of all participants. Webb argues that the use of eclectic methods to collect, analyse and evaluate data adds to the validity of emancipatory research, as findings are based on more comprehensive evidence.⁷

Emancipatory research is effective in solving problems of postoperative pain management in a specific context. Its collaborative and participatory nature facilitates acceptance of and commitment to changes of practice and their continued evaluation. Additionally, nursing scholarship in research is increased, as nurses are involved in the entire research process.

The emancipatory research method produces results specific to a particular working environment, which are therefore not generalisable. Nonetheless, the findings or actions may provide guidance for further research. Having emancipatory research wherever nurses are working can help build local solutions and local professionalism.

The importance of method

The relevance of the research method to the research question is the most significant factor for findings to influence improvements in clinical practice.² However, another factor has a direct effect on the application of research results, and can be related to the methodology used. Dufault et al report that a gap between theory, research and practice exists, a gap created by the time it takes studies to be published, the difficulty of interpreting abstract quantitative data in a practical context, and a lack of practising nurses reading and incorporating findings into practice.¹³

Quantitative knowledge has attempted to control, predict or explain what nurses should be doing and how patients should be responding.¹⁶ The multiple definitions, facts and laws developed are difficult to incorporate into practice and to use as the foundation for supportive and personal patient care.

Qualitative research can assist by providing additional information about which theory or technical application is optimal for patient care.¹⁵ Wilson-Thomas claims that the main advantage of emancipatory research is that it bridges the gap between theory, research and practice, and facilitates sustained changes in practice.¹⁶ Emancipatory research achieves this through a cyclic process, whereby the relationships between theory, research and practice are repeatedly examined and evaluated.⁸

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Communication for health and regional stability

THE 10TH ASIA-PACIFIC MILITARY MEDICINE CONFERENCE was held in Singapore from 7–12 May 2000. Co-hosted by the Singapore Armed Forces and the United States Army Pacific Command, this important regional forum brought together the leaders of military health from 28 nations. The Conference facilitates international health communication and promotes regional stability through cooperation in Australia’s specific regional area of interest.

The Conference attracted 480 registrants, of whom 18 were senior Australian health officers from all three Services. The military health of almost one-half of the world’s servicemen and women were represented by the Surgeons-General of China, Mongolia, Russia, Japan, India, Pakistan, Indonesia, Thailand and Sri Lanka, as well as several of the world’s smaller nations, including the Maldives and Kiribati.

The Conference was entitled *Hostile Environments — Challenge to Military Medicine*. The 140 papers presented provided a unique forum for discussion of shared challenges and of regional and nation-specific problems in military health. Among the themes discussed were bioterrorism, telemedicine and health issues raised by joint health deployments, particularly during United Nations peacekeeping work.

Australians delivered 14 papers, including reports on preventive medicine and health, the results of recent malaria research, logistic and planning issues in military medicine, military training methods with particular emphasis on the prevention of injuries and the maintenance of positive health, reducing sporting injuries in the military forces, a plenary paper on “The laws of war”, and medical ethics in the context of military medicine.

The Asia–Pacific military medicine conferences have been made possible by the generosity of the Health Branch of the United States Army Pacific Command, currently commanded by Major General Nancy Adams. The full-time conference coordination and planning team (Colonel Douglas

Biggerstaff, Lieutenant Colonel Benjamin Berg, Colonel Dale Vincent and Mr Dan Horne) are to be congratulated for achieving another step towards the vision of international communication in military health. The success of the Conference is also a product of the generosity and hospitality of the Medical Branch of the Singapore Armed Forces, and the tireless efforts of Brigadier General Lionel Lee, Colonel Wong Yue Sie and Colonel Low Wye Mun, all of the headquarters of the SAF Medical Corps.

Major General John H Pearn
Surgeon General ADF



Hosts of the Asia-Pacific Military Medicine Conferences. Left to right: Colonel Wong Yue Sie, FRCS, SMO(Health Care), of the Singapore Armed Forces, and Co-ordinator of the 10th Conference; Lieutenant General Preeyaphas Nilubol, Surgeon General of the Royal Thai Army Medical Department, host of the 9th Conference in 1999; Major General John Pearn, Surgeon General ADF (Australia was host of the 6th Conference in 1996); and Brigadier General Lionel KH Lee, Chief of the Medical Corps, SAF, and the Conference host this year.