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## Nursing health assessment: A meta-analysis

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*Edith Cowan University*

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**NURSING HEALTH ASSESSMENT: A META-ANALYSIS**

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**1991**

## USE OF THESIS

The Use of Thesis statement is not included in this version of the thesis.

## ABSTRACT

Health assessment is the responsibility of all nurses (McCain, 1965), however, it is frequently discussed without reference to any global definition and studied under a variety of conditions. The purpose of this study was to determine the influence of clinical setting, year of assessment, nursing education and experience in nursing on the scope of nursing health assessment using meta-analysis techniques. Sixty five research journal articles were located of which 16 primary studies were selected and grouped for analysis. The result of this analysis indicates there is a significant difference in the scope of nursing health assessment in varied clinical settings ( $p < 0.001$ ). No significant difference was found in the scope of nursing health assessment and year of assessment. No conclusions were drawn concerning the influence of nursing education due to conflicting results. The influence of experience in nursing on the scope of nursing health assessment could not be examined due to inadequate descriptions of experience in the primary studies. Only tentative conclusions could be drawn from the study, however, the findings have implications for nursing practice, education, theory and research.

## DECLARATION

**"I certify that this thesis does not incorporate, without acknowledgement, any material previously submitted for a degree or diploma in any institution of higher education; and that to the best of my knowledge and belief it does not contain any material previously published or written by another person except where due reference is made in the text."**

**Signature**

**Date.....08th SEPTEMBER 1992.....**

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## TABLE OF CONTENTS

Abstract.....	i
Declaration.....	ii
Acknowledgements.....	iii
List of Tables.....	vi
List of Figures.....	vii
Chapter	
1 INTRODUCTION	
1.1 Problem.....	1
1.2 Purpose.....	2
1.3 Hypotheses.....	2
1.4 Definition of Terms.....	3
1.5 Conceptual Framework.....	4
2 REVIEW OF LITERATURE.....6	
3 META-ANALYSIS	
3.1 Purpose.....	11
3.2 Advantages.....	12
3.3 Locating Studies.....	13
3.4 Selecting Appropriate Studies.....	14
3.5 Treatment of Studies.....	15
3.6 Limitations of Meta-Analysis.....	18



<b>4 METHOD</b>	
4.1 Population.....	19
4.2 Locating Studies.....	20
4.3 Selecting Appropriate Studies.....	21
<b>5 DATA ANALYSIS AND RESULTS</b>	
5.1 Introduction.....	23
5.2 Clinical Setting.....	24
5.3 Year of Assessment.....	30
5.4 Nursing Education.....	32
<b>6 DISCUSSION</b>	
6.1 Introduction.....	41
6.2 Clinical Setting.....	41
6.3 Year of Assessment.....	42
6.4 Nursing Education.....	43
6.5 Limitations.....	44
6.6 Implications for Nursing.....	46
6.7 Recommendations for Future Research.....	47
<b>7 CONCLUSION.....</b>	<b>50</b>
<b>REFERENCES.....</b>	<b>52</b>

## LIST OF TABLES

Table 4	Reasons for Exclusion of Primary Studies	22
Table 5.2.1	The Use of Physical Assessment Skills by Registered Nurses in Australia and the United States of America	24
Table 5.2.2	The Percentage of Physical Assessment Skills Perceived as Relevant by Nurses in New Zealand and the United States of America	28
Table 5.2.3	The Percentage of Client Physical Needs Assessed in Hospital and Home Settings	30
Table 5.3	Percentage of Clients' Physical Needs Identified by Decade	31
Table 5.4.1	The Percentage of Students and Registered Nurses Assessing Each Body System Using Physical Assessment Skills	34
Table 5.4.2	The Influence of Education of Nursing Health Assessment on Ability to Perform, Attitude, Knowledge and Use of Physical Assessment Skills	37
Table 5.4.3	The Influence of Education on Nursing Health Assessment: Control and Experimental Groups	40

## LIST OF FIGURES

Figure 1	Conceptual Framework	4
Figure 2	The Conversion of Means to Percentages for Number of Students Assessing the Skin	33

## CHAPTER 1

### INTRODUCTION

#### 1.1 PROBLEM

Nursing health assessments seek to affirm wellness (Fuller & Schaller-Ayers, 1990); identify specific needs (Cooper, 1986); evaluate the client's ability to cope (Gender, 1983) and establish an early client-nurse rapport (Cooper, 1986; Leonard, 1979). An incorrect or incomplete assessment may prevent the recognition of client problems and hinder the evaluation of nursing intervention.

McCain (1965) asserted that health assessment was the responsibility of all nurses. However, it is frequently discussed in terms of particular clients, symptoms, disease processes or clinical situations without reference to any global definition. Significant changes have occurred in nursing over the last 25 years including the introduction of tertiary education for nurses and the Nursing Process as a framework for organizing care. Furthermore, knowledge about factors affecting health is always increasing. As nurses have expanded their knowledge base and conceptualized their role it is expected that they become more effective practitioners. The varying circumstances underwhich studies addressing nursing health assessment have been undertaken make it difficult to have confidence in conclusions drawn about influencing factors.

## 1.2 PURPOSE

The purpose of this study is to determine the effect of clinical setting, year of assessment, nursing education and experience in nursing on the scope of nursing health assessment. Several primary studies will be reviewed using meta-analysis techniques to obtain a broader view than would otherwise be obtained through one primary study. The significance of this study for nursing lies in the implications of its findings for clinical practice, nursing education and theory.

## 1.3 HYPOTHESES

1. There is a significant difference in the scope of nursing health assessment in varied clinical settings.
2. There is a significant difference in the scope of nursing health assessment and the year of assessment.
3. There is a significant difference in the scope of nursing health assessment and nursing education.
4. There is a significant difference in the scope of nursing health assessment and years of experience in nursing.

#### 1.4 DEFINITION OF TERMS

There is disagreement in meta-analysis literature regarding how narrowly the variables of the study should be defined (Curlette & Cannella, 1985). This is discussed in Chapter Three under “Selecting Appropriate Studies”. Broad theoretical definitions were used at the beginning of data collection to enable the inclusion of a large number of primary studies and because it was not certain how nursing health assessment would be defined in these studies.

**NURSING HEALTH ASSESSMENT:** the process whereby the nurse obtains and analyses data that describes a person’s state of wellness, strengths relative to health promotion and responses to actual or potential health problems.

**SCOPE OF NURSING HEALTH ASSESSMENT:** the comprehensiveness of the nursing health assessment.

**CLINICAL SETTING:** the geographical locality, medical specialty and nature of the institution where the assessment take place.

**YEAR OF ASSESSMENT:** the year that the study was published. It is assumed that studies are published within five years of their undertaking.

**NURSING EDUCATION:** the qualifications and attendance of formal education sessions related to nursing.

**EXPERIENCE IN NURSING:** the number of years worked as a nurse in total and within a particular clinical setting.

### 1.5 CONCEPTUAL FRAMEWORK

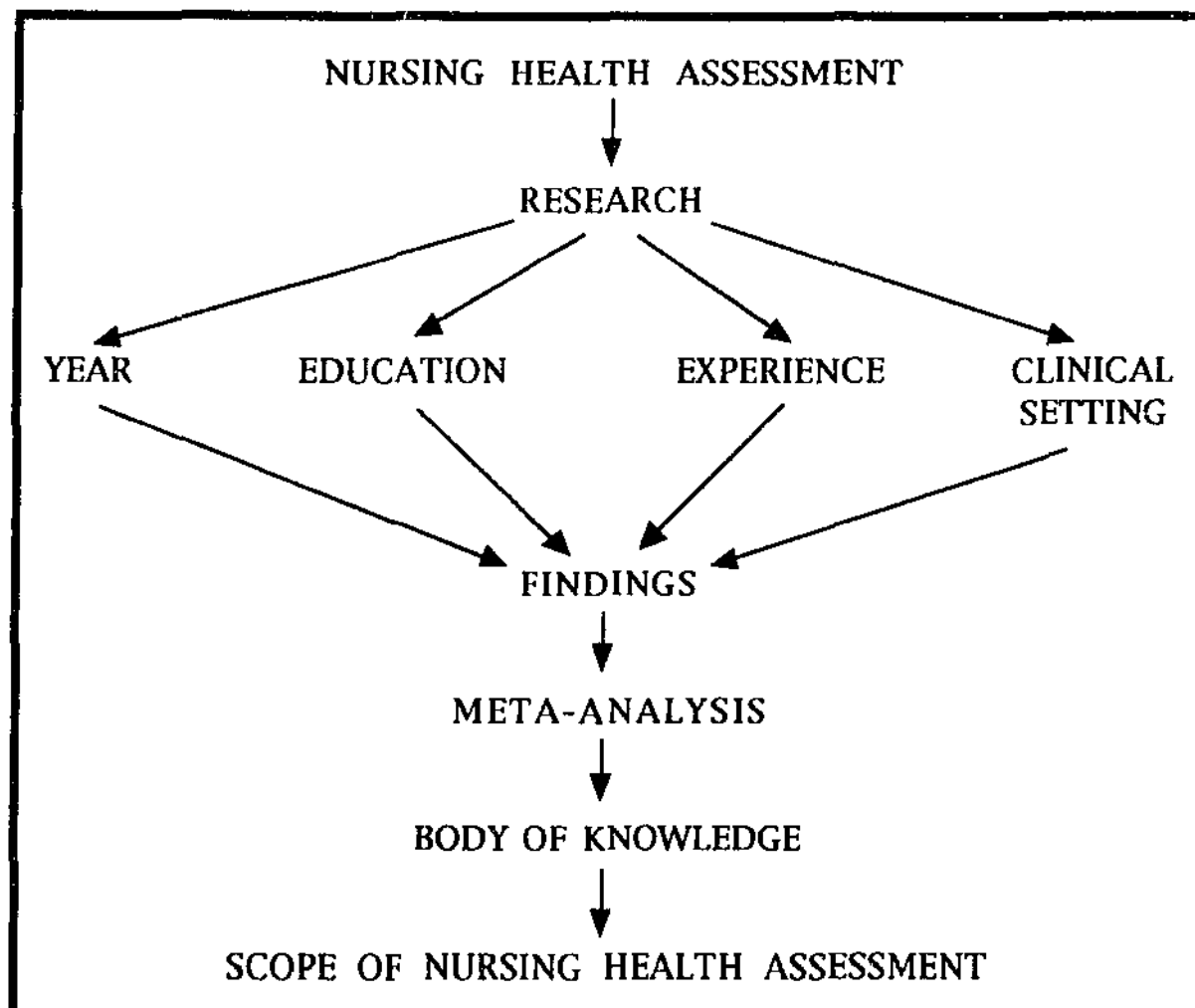


FIGURE 1: CONCEPTUAL FRAMEWORK

Figure One represents how this study should enhance the body of nursing knowledge in regard to nursing health assessment.

Nursing intervention is based on information available to nurses about each client. Factors suggested in nursing literature to influence the scope of nursing health assessment are clinical setting, year of assessment, nursing education and experience in nursing. The purpose of this study is to determine the impact of each of these factors by reviewing studies that have previous been undertaken under a variety of conditions. Bringing the findings of these studies together will provide a clearer picture of the state of knowledge concerning nursing health assessment. Not only will this enable nurses to make more informed decisions concerning health assessment but highlight possible deficiencies and inconsistencies in the research.



## CHAPTER 2

### REVIEW OF LITERATURE

The importance of nursing health assessment has long been recognised in nursing literature. McCain (1965) asserts it to be the responsibility of all nurses. In a survey of nurses by White (1972) the assessment of clients was ranked second as their most important function. Yura and Walsh (1983) recognise it as the beginning of nursing intervention.

Discussions on the focus of a nursing health assessment does not appear to have changed greatly despite changes in nurses' preparation and the delivery of nursing care to clients. These changes include the introduction of the Nursing Process as a problem-solving strategy, the advent of nurse practitioners and the shift of nursing education into tertiary institutions. In 1965, McCain asserted that the body had 13 functions which were classified under the headings of mental, emotional, sensory perception and motor ability. She suggested that nursing health assessment should be on-going to evaluate and modify the plan of care as the client's behaviour or functional abilities change. In a discussion on nursing diagnoses, Gordon (1982) advocated 11 functional health patterns. They included items directed at revealing physical and psychosocial problems as well as strengths and health promoting behaviours. Gordon (1982) asserted that these patterns were relevant

to all conceptual models because they sought basic information and dealt with the “what” not the “why” of assessment. Without the support of research it is difficult to determine whether these authors are discussing what occurs or what should occur.

Conflicting opinions are often expressed concerning the acceptable scope of assessment. Mallick (1981) asserts that the nursing view of the person as a biopsychosocial being necessitates the collection of extensive data and lengthy assessment forms. Benner and Wrubel (1989) emphasize the need to understand the individual’s personal meanings and social context. Others recommend focussed rather than comprehensive assessments with consideration of goals, priorities, relevance of data and what can realistically be done (Castledine, 1980; Fuller & Schaller-Ayers, 1990; Pinnell & de Meneses, 1986). Studies on the use of physical assessment skills indicate that practicing nurses tend to undertake focussed rather than comprehensive assessments (Colwell & Smith, 1985; Jarvis, 1984; Montgomery, 1990).

The type of information sought during nursing health assessment is thought to be influenced by several factors. In a study of the implementation of the Nursing Process, Smeltzer and Juhasz (1990) found that data collection on client admission was significantly related to the type of medical specialty. Several studies have found nurses in hospital to be reluctant to assess the psychosocial needs of clients even

on psychiatric units (Miller, 1985; Morrison, 1989). Petersen (1988) found that although hospital nurses demonstrated knowledge of psychosocial nursing concepts, client care was limited to physical care and nurses did not appear to notice nor respond to clients' verbal and non-verbal distress unless that behaviour was disruptive. In contrast, Wingate and Lackey (1989) found that nurses working in the home care setting identified only 20.9% of client needs as physical.

Most of the research related to nursing health assessment has been undertaken to evaluate the performance of nurses in the United States of America (U.S.A.). No studies were found that compared the performance of nurses from the U.S.A. and other countries where education and experiences may be influenced by different cultural expectations and community needs. Differences in the expectations and roles of nurses may be suggested by what information nurses view as relevant when undertaking health assessments. In the U.S.A., Colwell and Smith (1985) found that failure to identify aspects of health assessment as problem areas and nursing responsibilities ranked high as deterrents to the use of physical assessment skills. In New Zealand, Jarvis (1984) found that nurses perceived only nine percent of given physical assessment skills as relevant to nursing.

Differences in nurses' expectations and roles in different settings may also be reflected by the reaction of colleagues. Although physical

assessment skills were once the exclusive domain of medical practitioners research does not support the notion that doctors actively discourage their use by nurses (Brown, Brown & Bayer, 1987; Reaby, 1990). Reaby (1990) found, however, that 17.6% of Australian nurses cited nursing colleagues as deterrents to their use of physical assessment skills.

The manner in which nurses approach health assessment is likely to be influenced by their preparation in terms of education and experience. Lack of familiarity with physical assessment skills has been found to rank high as a deterrent to their use (Brown, Brown & Bayer, 1987; Carrieri, Stotts, Levinson, Murdaugh & Holzemer, 1982; Colwell & Smith, 1985). Lynaugh and Bates (1974) suggest that competence without confidence leads to the deterioration of skills through lack of use, however, confidence without competence is dangerous. Although McCloskey (1983) and Johnson (1988) found significant differences in nursing education and job performance, Smeltzer and Juhasz (1990) found neither nursing education nor experience were significantly related to data collection on client admission.

Joseph (1990) asserts that assessment is the first step towards initiating change. Positive changes can be made in the status of clients' health through health assessment. Positive changes in nursing practice can be made through its assessment using the research process.

Research can be refined and redirected towards meaningful ends by assessment through meta-analysis techniques. A meta-analysis of research on nursing health assessment , therefore, ultimately seeks to enable nurses to have a positive impact on the health status of clients.

## CHAPTER 3

### META-ANALYSIS

This chapter discusses issues relevant to quantitative meta-analysis as advocated by Mullen (1989).

#### 3.1 PURPOSE

As nurses recognize the relevance of research to clinical practice and more studies are undertaken there is an increasing need for valid methods of summarizing research findings. Present methods include the traditional narrative review and quantitative approaches such as vote-counting, p-value cluster and meta-analysis (Curlette & Cannella, 1985). Meta-analysis is the application of the research process to a collection of studies in a given area (Smith & Stullenbarger, 1989). Although the term was first proposed by Gene Glass in 1977 the techniques of meta-analysis are not new (Fisher, 1932; Lush, 1931; Pearson, 1933).

The purpose of meta-analysis is to review, evaluate and synthesize research findings across several studies in relationship to a single hypothesis (McLaughlin & Marascuilo, 1990). To date, nurse researchers have used meta-analysis to explicate the state of knowledge on pre-operative instruction (Hathaway, 1986); clinical cost-saving (Devine & Cook, 1986); education and performance (Johnson, 1988) and pain

intervention (Broom, Lillis & Smith, 1989).

### 3.2 ADVANTAGES

The advantage of meta-analysis over the traditional narrative review relates to the use of the research process. The rules for inclusion of studies in a narrative review are not usually made explicit. Furthermore, Mullen (1989) warns that narrative reviews employing the same studies have lead researchers to opposing conclusions. For example, on reviewing the same studies examining the cognitive performance of adopted children Munsinger (1974) concludes that the environmental effects of children's IQ test scores are small whereas Kamin (1978) concludes they are significant.

In a meta-analysis, primary research studies are treated in a similar manner to the participants in a primary study. Comparable to the description of setting, population, sample and data analysis in a primary study, the rules for inclusion of studies and treatment of the findings are always explicit in the meta-analysis. Data must also be independent. The replication of a meta-analysis should thus yield similar conclusions. Meta-analysis identifies an array of instruments, outcome variables and bibliographic sources. Moreover, it provides a database for secondary analysis and generates hypotheses for future studies.

### 3.3 LOCATING STUDIES

Threats to field representation of data are analogous to accessibility to every element in a population. Some studies may not be published because they are undertaken solely to provide information to an institution whilst others may be subject to publisher bias against studies that support the null hypothesis (Curlette & Cannella, 1985). Smith (1980) found that effect sizes (magnitude of effect) varied greatly depending upon how the findings of the studies were made known.

Mullen (1989) describes six methods of locating studies for a meta-analysis. Ancestry is the retrieval of studies through bibliographies and reference lists. Descendency is the use of indexing sources such as the Social Science Index. Abstracting services such as Dissertation Abstracts International and on-line computer services such as Medline can also be used. Use of the "Invisible College" involves letters, telephone calls and conversations at conferences as well as formal and informal professional networks. Browsing is noted to be an undervalued skill and particularly useful if the topic is approached by other disciplines or is likely to be discussed in conference reports. Curlette and Cannella (1985) add the identification of major publishers of primary research in order to review their publications and major institutions that are likely to initiate primary research on the topic of interest.



### 3.4 SELECTING APPROPRIATE STUDIES

There is disagreement concerning the inclusion of studies using varying definitions, research designs and instruments. Mullen (1989) suggests that a clear operational definition of the dependent variable leads to a more defensible meta-analysis. On the other hand, Cooper (1984) advocates the use of the broadest possible definition to allow the inclusion of borderline studies. Concerning the use of studies of dissimilar research design and instruments, Curlette and Cannella (1985) note that there would be no need to compare studies that were identical in all respects because their findings should be the same within statistical error. Furthermore, "same" remains undefined and if summarizing across different groups of people is legitimate in a primary study then summarizing across different research approaches should be acceptable in a meta-analysis. Some researchers advocate differential weighting of research findings to account for differences in the quality of studies, however, there is no consensus on how this should be approached (Curlette & Cannella, 1985).

The ability to undertake a meta-analysis relies on accurate descriptions of all elements of each primary study including all influencing variables. Although this techniques can be applied to descriptive studies, it is better suited to correlational and experimental research designs. Non-statistical studies such as case studies and historical reviews are difficult to treat in a traditional quantitative

meta-analysis. They may be better suited to analysis using qualitative techniques.

### 3.5 TREATMENT OF STUDIES

Statistics used in the data analysis of primary studies deal with central tendency, variability and prediction. Data analysis in a meta-analysis can be undertaken using the original raw data or the outcome statistics of the primary studies.

To compare the results of studies where different statistical tests were used they must be transformed to a common measure. Pearson's Product-Moment Correlation Coefficient ( $r$ ), Fisher's  $Z$  and Cohen's  $d$  are common measures used in meta-analysis (Mullen, 1989). Formulae for transforming results to  $r$  values are given below.

$$t \quad r = [t^2 / (t^2 + df)]^{1/2}$$

$$F (1df): \quad r = [F / (F + df)]^{1/2}$$

$$\chi^2 (1): \quad r = (\chi^2 / N)^{1/2}$$

$$Z \quad r = (Z^2 / N)^{1/2}$$

(Mullen, 1989, p44)

The distribution of  $r$  becomes skewed at extremes of the scale. It is important to correct this so that valid comparisons can be made. This is

resolved by the Fisher Z transformation of r.

$$Z_{\text{Fisher}} = 0.5 \{ \log[(1 + r)/(1 - r)] \}$$

(Mullen, 1989, p45)

This formula involves the use of natural logarithms.

Cohen's d refers to the difference between means for two groups. There are various methods of determining d values depending on one's calculation of an appropriate standard deviation and whether it is adjusted for small sample bias.

Significance levels also need to be transformed. Mullen (1989) states that the common measure for significance levels are Z scores and p values. A Z score is the standard normal deviate with a mean of zero and a standard deviation of one. It has a direct association with p values. Formulae for calculating the Z score are given below for each type of statistic.

$$t: Z = \{df[\log(1 + (t^2/df))]\}^{1/2} \{1 - [1/(2df)]\}^{1/2}$$

$$F: Z = \{df[\log(1 + (F/df))]\}^{1/2} \{1 - [1/(2df)]\}^{1/2}$$

$$\chi^2: Z = (\chi^2)^{1/2}$$

$$r: t = [r(N - 2)]^{1/2} / (1 - r^2)^{1/2}$$

then convert to Z

(Mullen, 1989, p43)

There has been debate over whether significance levels or effect sizes are more appropriate or informative. Mullen (1989) states that this represents a lack of appreciation of the mutual dependence of significance level and effect size:

$$\text{EFFECT SIZE} = \text{SIGNIFICANCE LEVEL} / \text{STUDY SIZE}$$

(Mullen, 1989, p47)

The effect size of a statistical test together with the degrees of freedom are used to determine at what level the results are significant. In statistical tests, the degrees of freedom are calculated using the sample size. Therefore, effect size and significance level are mutually dependent.

Presentation of insufficient data in the primary studies is a common problem facing researchers attempting to undertake a meta-analysis. In a study on the effectiveness of patient education, McCain and Lynn (1990) found that only 52% of located studies reported sufficient information to enable calculation of an effect size. Mullen (1989) suggests reconstructing the necessary statistical tests. Corresponding with the primary researcher is an effective means of obtaining needed information although this may cause the researcher apprehension and be impossible due to relocation of the researcher or destruction of data.

If one is unable to reconstruct the necessary statistical tests Mullen (1989) states a conservative estimate of study outcomes can be made through the significance statements. For example, statement of no significant effect can be represented as  $Z = 0.000$  ( $p=0.500$ ). Statements of significant effect can be represented as  $Z=1.645$  ( $p=0.050$ ). Although these estimates are false they are the most defensible values when no statistic is given.

### 3.6 LIMITATIONS OF META-ANALYSIS

The limitations of a meta-analysis include all the limitations of each primary study used. Furthermore, even when studies under review have experimental designs, there always remains some doubt concerning the cause of variation in their analysis.

## CHAPTER 4

### METHOD

This study seeks to determine the effect of clinical setting, year of assessment, nursing education and experience in nursing on the scope of nursing health assessment. This chapter describes the rules for inclusion of primary studies for meta-analysis and retrieval methods.

#### 4.1 POPULATION

The population consists of all retrievable studies investigating nursing health assessment. Inclusion criteria is journal articles written in English, published after 1950 and stocked at libraries in Perth, Western Australia. It is considered that with the introduction of the Nursing Process and rise of nursing research in the sixties that it would be unlikely for research concerning nursing health assessment to be undertaken prior to 1950.

The libraries of two universities and six major public teaching hospital were included because they list a large selection of nursing journals, use computer or card referencing systems, have photocopying facilities and allow access by nurses regardless of their employment status with the institution.

## 4.2 LOCATING STUDIES

Data collection took place over three weeks using three techniques. A computer search was undertaken using Cinahl which listed nursing literature between 1983 and June 1991. Using the keywords "nursing", "health" and "assessment" 925 references were found. Only references from journal articles that discussed nursing health assessment were retrieved. These included commentaries and studies on the Nursing Process, quality assurance surveys, nursing education, client needs and physical assessment skills. References to articles that discussed nursing assessment of particular client symptoms, for example, pain or disease processes, were not retrieved because it was not known to what extent such assessments would be focussed. Articles were sought using these references and lists of journal holdings available available at the eight libraries.

Ancestry is the retrieval of studies through the bibliographies and reference lists of articles already retrieved. The reference lists or articles obtained from the computer search were examined for articles using the same criteria as the computer search. Once these articles were obtained their reference lists were examined. This process continued until redundancy was experienced or references preceding 1950 were given.

Recent issues of major research journals were reviewed. They

included:

Applied Nursing Research (1988-1990)

Australian Journal of Advanced Nursing (1988-1990)

Canadian Journal of Nursing Research (1988-1990)

Journal of Nursing Quality Assurance (1989-1990)

Nursing Research (1980-1990)

Western Journal of Nursing Research (1988-1990).

Articles retrieved from these journals were also subject to ancestry as previously described.

#### 4.3 SELECTING STUDIES

Sixty five primary studies addressing nursing health assessment were located of which 18 were judged as relevant and presented sufficient information for comparison using meta-analysis techniques. Table Four describes the reasons why 47 studies were excluded.

Two of the 18 primary studies initially selected were later excluded because their definitions of nursing health assessment were not considered sufficiently comparable to definitions used in other studies. The remaining 16 studies varied in research design from surveys to correlational and experimental using questionnaires, interviews, non-participant observation and review of records to



investigate the attitudes and behaviours of between 59 and 200 nurses.

They will be discussed in more detail in the next chapter.

<b>Number of Studies</b>	<b>Reason for Exclusion</b>
18	Nursing health assessment not adequately defined
11	Sought to evaluate the reliability and validity of instruments
10	Nursing health assessment not adequately differentiated from other factors during data analysis*
3	Questions targetted people who may not be responsible for the routine care of clients#
1	Discussed assessment of the community not individuals
1	Evaluated the attitudes of student nurses towards education courses
1	Discussed assessment of nursing homes
1	Sought to determine the health status of a client group by one assessor
1	Sought nurses' opinions of continuing education

\* For example, job performance

# Included clinical specialists and clients

## CHAPTER 5

### DATA ANALYSIS AND RESULTS

#### 5.1 INTRODUCTION

This chapter describes the treatment of primary studies that were selected for analysis and the results. To minimise the impact of confounding variables and enable the use of clearer definitions of the dependent variable, scope of nursing health assessment, different studies were grouped for analysis. They will be described separately as they are analysed. A significance level of  $p < 0.05$  was used.

The fourth hypothesis which states there is a significant difference in the scope of nursing health assessment and years of experience in nursing could not be tested because the few number of studies where the experience of participants was described did not have comparable definitions of nursing health assessment.

## 5.2 CLINICAL SETTING

### 5.2.1 Use of Physical Assessment Skills: Australia and the United States of America

<b>Skill</b>	<b>Australia (n=22)</b>	<b>United States of America (n=59)</b>
Apical Pulse	11	59
Auscultate Lungs	9	59
Inspect Inner Nose	1	30
Ophthalmoscopy	0	9
Otoscopy	6	10
Palpate Breasts	4	15
Percuss Thorax	3	25
Palpate Axilla	4	25
Tactile Fremitus	0	30
Tendon Reflexes	2	26
Test Cranial Nerves	2	31

In the United States of America (U.S.A.), Colwell and Smith (1985) investigated the use of 36 physical assessment skills by 59 registered nurses with baccalaureate degrees working in the paediatric setting of two large metropolitan hospitals. In Australia, Reaby (1990) investigated the use of the same skills by 22 registered nurses with unspecified nursing education from hospitals, nursing homes and the

community health service. The experience of nurses in neither of these samples was described. Questionnaires were used in both studies.

Presentation of data in these articles allowed the use of 11 skills to be compared. The dependent variable, scope of nursing health assessment, is defined in this analysis as the use of these 11 skills. They are listed in Table 5.2.1. The independent variable, clinical setting, is defined as country of assessment.

A t-test was considered to compare these score, however, it is unlikely that the assumption of normal distribution of nurses for each skill can be made. The scores were thus compared using the percentage use of physical assessment skills by each group of participants. This was estimated by dividing the sum of scores for each skill by the total possible number for each sample. The total possible number was calculated by multiplying the number of skills by the number in each sample.

Percentage use of skills in the U.S.A.

$$= \frac{319 \times 100\%}{11 \times 59}$$

$$= 49.15\%$$

Percentage use on skills in Australia

$$= \frac{42 \times 100\%}{11 \times 22}$$

$$= 17.36\%$$

Using these percentages and chi-square analysis, a significantly greater use of the 11 physical assessment skills was found in the U.S.A. than in Australia ( $X^2=22.76$ ,  $p<0.001$ ). The results of this analysis supports the first hypothesis which states there is a significant difference in the scope of nursing health assessment in varied clinical settings.

### *5.2.2 The Perceived Relevance of Physical Assessment Skills: New Zealand and the United States of America*

Jarvis (1984) investigated the attitudes of nurses and clients to the use by nurses of physical assessment skills in New Zealand. Nurses were extracted from 17 medical and surgical units of an adult hospital. Their nursing education was not described, however, nearly half of the sample had less than five years experience in nursing. In the United States of America, Colwell and Smith's (1985) study were asked nurses from a paediatric setting why each of 36 physical assessment skills were not used. All these nurses had baccalaureate degrees, however, their experience in nursing was not described. Questionnaires were used in

both studies.

The dependent variable, scope of nursing health assessment, is defined in this analysis as the perception of the relevance of use by nurses of physical assessment skills. It is assumed in this analysis that perceived lack of relevance was indicated in the study by Colwell and Smith (1985) when the participant responded that a skill was not considered a problem or a nursing responsibility. Clinical setting was defined as country and medical specialty.

Data from both studies were converted to percentages and compared using chi-square analysis. The frequencies given by Colwell and Smith (1985) were converted by dividing the sum of responses given as not considered a problem and a nursing responsibility by the total possible number of responses. The percentages are given in Table 5.2.2.

<b>TABLE 5.2.2</b>		
<b>The Percentage of Physical Assessment Skills Perceived as Relevant by Nurses in New Zealand and the United States of America</b>		
<b>Country</b>	<b>Relevant</b>	<b>Not Relevant</b>
New Zealand	17.36	82.64
U. S. A.	49.15	50.85
$\chi^2 = 91.6$ $df = 1$ $p < 0.001$		

The results indicate that significantly more nurses in the paediatric setting in the U.S.A. perceived the physical assessment skills as relevant than nurses caring for adults in New Zealand ( $\chi^2 = 91.6, p < 0.001$ ). This supports the first hypothesis which states there is significant difference in the scope of nursing health assessment in varied clinical settings.

### *5.2.3 The Identification of Client Needs: Hospital and Home Settings*

Wingate and Lackey (1989) investigated the needs of clients with cancer and their caregivers in the home setting. The sample included nine nurses with nursing education ranging from a nursing diploma to a

masters degree in nursing. Their experience in nursing averaged greater than 15 years with an average of greater than five years experience caring for clients in the home setting. A self-administered questionnaire, the Object Content Test, was used in this study. Needs were classified as psychological, physical, information, legal or financial, spiritual, household and others.

Morrison (1989) sought to describe the content of assessments made during nursing assessment rounds in hospital using taped interactions. She classified client needs as survival, closeness and freedom needs. Survival needs referred mainly to physical needs. Thirty four interactions were examined but it is not known how many nurses participated in the study nor their nursing background. Both studies were undertaken in the United States of America and involved the assessment of adult clients.

The dependent variable, scope of nursing health assessment, is defined in this analysis as the percentage of client physical needs assessed as opposed to other needs. The independent variable, clinical setting, is defined as hospital or home setting. Client physical needs were compared using percentages and chi-square analysis as shown on Table 5.2.3.



TABLE 5.2.3		
The Percentage of Client Physical Needs Assessed In Hospital and Home Settings		
Client Needs	Hospital	Home Setting
Physical	73.0	20.9
Other	27.0	79.1
$\chi^2 = 54.5$ $df = 1$ $p < 0.001$		

The results of this analysis indicate that a significantly greater number of physical needs are assessed in hospital than in the home setting ( $p < 0.001$ ). This supports the first hypothesis which states that the scope of nursing health assessment is significantly different in varied clinical settings.

### 5.3 YEAR OF ASSESSMENT

#### *Assessment of Client Needs in the 1970s and 1980s*

Hefferin and Hunter (1975) attempted to determine whether an objective observation tool would affect the entries made on nursing care plans. They examined 90 nursing care plans of clients admitted to a hospital in the Intermediate Care Service. Morrison (1989) used taped

interviews to determine the content of nursing health assessments made during assessment rounds. The number of nurses participating in both of these studies is not known nor are their nursing backgrounds. Both studies were undertaken in the United States of America.

The dependent variable, scope of nursing health assessment, is defined in this analysis as the percentage of client needs or problems defined as physical or otherwise. The independent variable is defined as the decade in which the assessment was made. Comparisons are demonstrated on Table 5.3.

<b>TABLE 5.3</b>		
<b>Percentage of Clients' Physical Needs Identified by Decade</b>		
<b>Client Needs</b>	<b>1970s</b>	<b>1980s</b>
Physical	60.0	73.0
Other	39.4	27.0
$\chi^2 = 3.47$ $df = 1$ $p = 0.1$		

The results of this analysis indicate that there no significant difference in the percentage of client physical needs or problems assessed in the 1970s and 1980s. This result does not support the second hypothesis which states that there is a significant difference in the scope of nursing health assessment and the year of assessment. The second hypothesis is, therefore, rejected.

## 5.4 NURSING EDUCATION

### *5.4.1 The Use of Physical Assessment Skills: Nursing Students and Registered Nurses.*

In 1988, Schare, Gilman, Adams and Albright sought to assess the attitudes and use of health assessment skills of 92 sophomore baccalaureate students. The age of these students ranged from 19 to 40 years, however, no other background of the sample is given.

In 1987, Brown, Brown and Bayer sought to investigate whether the acquisition of additional skills through continuing nursing education had an impact on the practice of 145 nurses. Over one third of these nurses had a baccalaureate or higher degree and they had all undertaken courses on physical assessment. Their experience in nursing is not known.

Both of these studies were undertaken in the United States of

America where participants worked in a variety of clinical settings. Both studies used self-administered questionnaires that addressed body systems and had been subject to pilot tests.

The dependent variable, scope of nursing health assessment, is defined in this analysis as the assessment of four body systems using physical assessment skills. The independent variable, nursing education, is defined as sufficient education to be registered as a nurse.

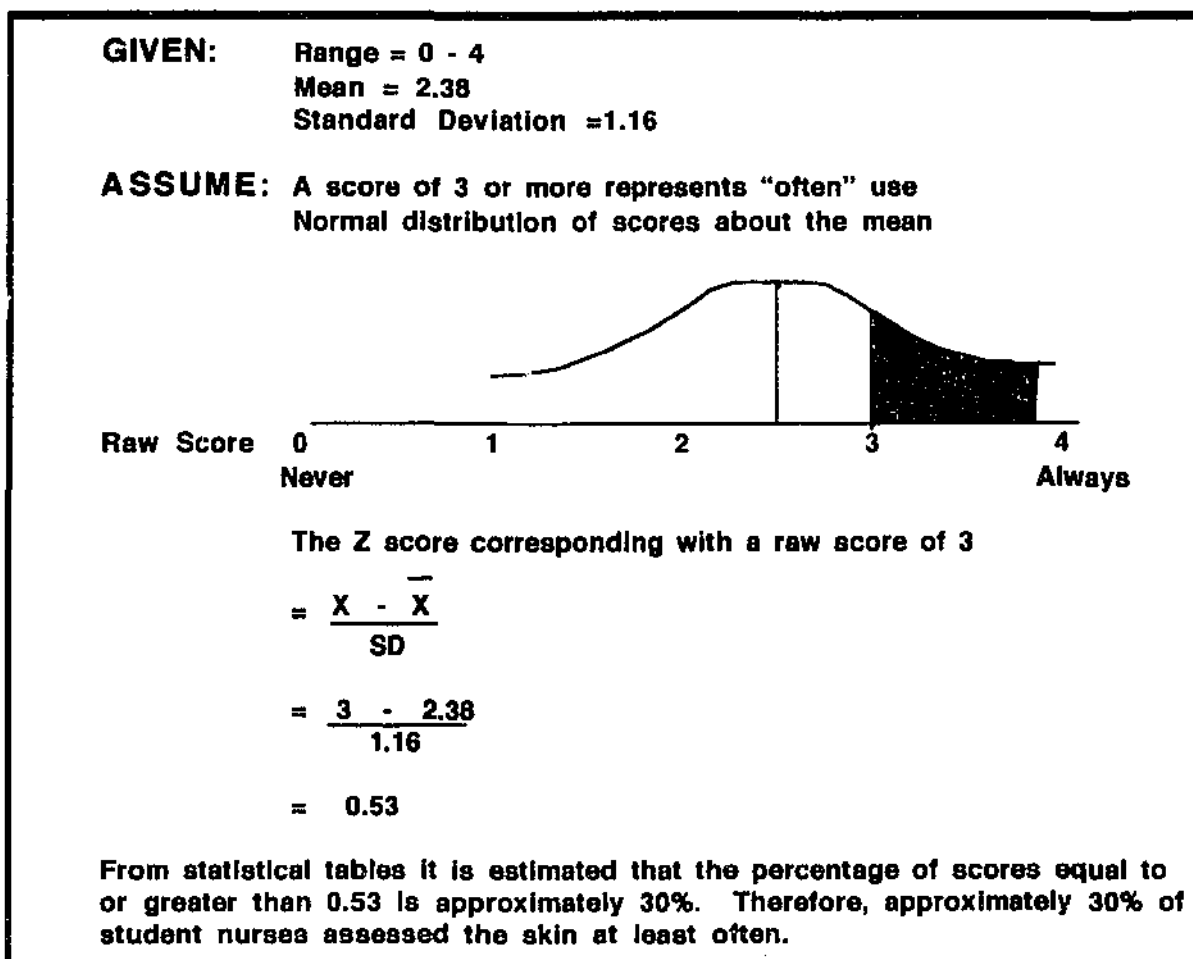


FIGURE 2: THE CONVERSION OF MEANS TO PERCENTAGES FOR NUMBER OF STUDENTS ASSESSING THE SKIN

Comparisons between the two studies was difficult because the results were presented as means with standard deviations (Schare et al., 1988) and percentages (Brown et al., 1987). To convert the results given by Schare et al. (1988) to percentages two assumptions were made. The first assumption was that on the five point Likert scale used by these investigators and marked "0" for never and "4" for always, "3" meant often. The second assumption was that scores were distributed normally about the means for each body system. Given these two assumptions, the percentage of students was calculated by converting the scores to Z scores and using a tables book to estimate the percentage of nurses with a raw score of three or greater. This method is demonstrated in Figure 2. Not all systems were reported in a manner that enabled them to be compared. Table 5.4.1 lists the four systems that were compared.

<b>TABLE 5.4.1</b>		
<b>The Percentage of Students and Registered Nurses Assessing Each Body System Using Physical Assessment Skills</b>		
<b>System</b>	<b>Student Nurses (n=92)</b>	<b>Registered Nurses (n=145)</b>
Skin	27.2	93
Neurological	0.01	58
Lungs/Thorax	0.28	88
Abdomen	0.23	58
<b>Total</b>	<b>27.72</b>	<b>297</b>

To compare the findings of the two primary studies, scores were converted to percentages and compared using chi-square analysis. The result of this comparison ( $X^2=45.98$ ,  $p<0.001$ ) indicates that significantly more registered nurses assessed the body systems. This result supports the third hypothesis which states there is a significant difference in the scope of nursing health assessment and nursing education.

#### *5.4.2 Nursing Education and Changes in the Ability of Perform, Attitude Towards, Knowledge and Use of Physical Assessment Skills*

Studies concerning the impact of education courses on nursing health assessment were confined to evaluating course on physical assessment.

Reaby (1990) evaluated the effectiveness of teaching comprehensive physical assessment skills through five eight-hour workshops. Questionnaires were used to determine the knowledge and use of physical assessment skills. Findings were reported as frequencies, percentages and on graphs.

Schare et al (1988) compared changes in the attitudes towards use of physical assessment skills before and three-quarters through a oneyear course. Twenty five percent of course time consisted of classroom work with the remainder involving clinical experience in

laboratories and clinical settings. A questionnaire was used and data was analysed using a Student's t-Test.

Clarke, Goggin, Webber-Jones, Vacek and Aderhold (1986) evaluated changes in the performance of respiratory physical assessment after 20 collaborative training visits with a trained assessment educator after six months. The results were reported as mean scores.

Holzemer, Barbauskas and Ohlson (1980) evaluated four workshops on health assessment. They failed to define health assessment, however, they referred solely to the importance of physical assessment implying that this was the subject of the workshops. Twenty five percent of the time in the workshops was allotted to laboratory and clinical practice sessions. Knowledge of assessment was determined through a multiple choice questionnaire and compared using a Student's t-Test.

In this analysis, the dependent variable, the scope of nursing health assessment, is defined as ability to perform, attitude towards, knowledge or use of physical assessment skills. The independent variable, nursing education, is defined as formal education in physical assessment. To compare the findings of each primary study, the influence of education needed to be quantified and a common outcome

statistic obtained. The percentage scores reported by Reaby (1990) were converted to frequencies and compared using Paired-Comparison t-Tests. The mean scores reported by Clarke et al. (1986) were treated as raw scores and compared using Paired-Comparison t-Tests. Although, the results of the primary studies were now presented as t-tests, conversion to the Pearson Product Moment Correlation Coefficient,  $r$ , made their findings easier to interpret. The results of the conversions are given in Table 5.4.2.

<b>TABLE 5.4.2</b>			
<b>The Influence of Education of Nursing Health Assessment on Ability to Perform, Attitude, Knowledge and Use of Physical Assessment Skills</b>			
<b>Researcher</b>	<b>Item</b>	<b>r</b>	<b>z</b>
Reaby (1990)	Knowledge	0.685	3.424
Reaby (1990)	Use	0.565	3.642
Schare et al. (1988)	Attitude	0.555	4.837
Clarke et al. (1986)	Ability to Perform	0.996	2.666
Holzemer et al. (1980)	Knowledge	0.952	13.275



The result of these analyses indicate there is a significant difference before and after formal education in physical assessment ( $p < 0.01$ ). This result supports the third hypothesis which states there is a significant difference in the scope of nursing health assessment and nursing education.

#### *5.4.3 Nursing Education and Health Assessment: Control and Experimental Groups*

Oleske, Otte and Heinz (1987) sought to evaluate a system of monitoring the quality of oncology nursing care in the home setting using audit forms and client records. The nurses in the study were not described other than they were derived from 29 home health agencies. One control and two experimental groups before and after the introduction of a continuing education program on cancer. The audit form included questions concerning the assessment of physical and psychosocial needs.

Oliver (1984) sought to evaluate the effect of continuing education programs on the ability of nurses to perform and document the use of physical assessment skills by observation and review of client records. Information was gathered on 153 community health nurses. The outcomes for groups in two education programs were compared with one control group.

Hagopian, Wemmet, Ames, Gelein, Osborne and Humphrey (1982) compared two methods of teaching physical assessment skills to 44 registered nurses employed at a community health agency. Nurses were randomly assigned to each educational group. One group was given a reading assignment and two-hour laboratory sessions involving practice and watching films. The other group was involved in self-directed study with members being given annotated bibliographies and a list of available audio-visual materials. Knowledge and ability to perform physical assessment skills were tested for each group.

The dependent variable, scope of nursing health assessment, was defined in this analysis as documentation, knowledge and performance of health assessment. The independent variable, nursing education, is defined as whether or not supervised education involving clinical practice was provided. The results of the primary studies were converted to the Pearson Product Moment Correlation Coefficient are given in Table 5.4.3.

<b>Researcher</b>	<b>Measure</b>	<b>Result</b>	<b>r</b>	<b>z</b>
Oleske et al. (1987)	Documentation	"No significant difference"	----	0.00
Oliver (1984)	Documentation	F = 3.81	0.81	1.26
	Performance	"No significant difference"	----	0.00
Hagopian et al. (1982)	Knowledge	t = 2.08	0.31	2.02
	Performance	t = 2.40	0.35	0.31

Three of the five primary analyses did not produce results that were statistically significant. Furthermore, although Oliver (1984) reported a significant difference between control and experimental groups, there were no significant difference in tests conducted before and after education was initiated. The difference in nurses' performance of health assessment was found to be significant by Hagopian et al. (1982) but not significant by Oliver (1984). The result of this analysis, therefore, does not support the third hypothesis which states that there is a significant difference in the scope of nursing health assessment and nursing education.

## CHAPTER 6

### DISCUSSION OF FINDINGS

#### 6.1 INTRODUCTION

The purpose of this study was to determine the effect of clinical setting, year of assessment, nursing education and experience in nursing on the scope of nursing health assessment. The effect of experience in nursing could not be examined because the primary studies that included a description of the nursing experience of participants did not have comparable definitions of nursing health assessment.

#### 6.2 CLINICAL SETTING

*The first hypothesis states there is a significant difference in the scope of nursing health assessment in varied clinical settings.*

This was tested in three analyses. Nurses in the United States of America (U.S.A.) were found to use 11 physical assessment skills significantly more frequently than nurses in Australia ( $p < 0.001$ ). The perceived relevance by nurses of physical assessment skills was found to be significantly greater in the U.S.A. than New Zealand ( $p < 0.001$ ). A significantly greater percentage of physical needs were identified by nurses in hospital than in the home setting ( $p < 0.001$ ).

Using the given definitions, the results support the first hypothesis

which states there is a significant difference in the scope of nursing health assessment in varied clinical settings at  $p < 0.001$ . This finding complements those of Smeltzer and Juhasz (1990) who found that data collection on client admission was significantly related to type of hospital unit. However, in an unpublished study conducted in Western Australia (Montgomery, 1990) the percentage use of physical assessment skills by nurses was within two percent of that by nurses in the U.S.A. (Colwell & Smith, 1985). It is not clear whether differences in nursing health assessment occur between Australian states. The differences in nursing health assessment between countries may also be accounted for by different nursing preparation and roles.

### 6.3 YEAR OF ASSESSMENT

*The second hypothesis states that there is a significant difference in the scope of nursing health assessment and the year of assessment.*

This was tested in one analysis. A chi-square analysis of the percentage of client physical needs identified in the 1970s and 1980s found no significant difference ( $p < 0.1$ ). The second hypothesis is therefore rejected.

No other studies were found that compared nursing practice between decades. In view of the small number of studies included in this analysis and the manner in which they were attained broad

generalizations are not appropriate. However, it suggests that an undercurrent of temporal stability may exist in nursing despite organizational changes.

#### 6.4 NURSING EDUCATION

*The third hypothesis states there is a significant difference in the scope of nursing health assessment and nursing education.*

This hypothesis was tested in three analyses. Registered nurses were found to assess body systems using physical assessment skills significantly more often than student nurses who had been taught these skills ( $p < 0.001$ ). The attitude, ability to perform, knowledge and use of physical assessment skills by registered nurses was found to improve significantly following formal education in physical assessment ( $p < 0.001$ ). The impact of formal education, however, was not found to be significant on comparing control and experimental groups.

The results of these analyses are conflicting. Although the hypothesis was supported in two out of three analyses no conclusion could be made with confidence. Significant though moderately weak correlations were found when examining the use of assessment skills ( $r = 0.56$ ) and attitude towards assessment ( $r = 0.55$ ). Differences between the samples, research instruments, teaching methods and length of time over which participants were observed are likely to have contributed to

this lack of consensus.

## 6.5 LIMITATIONS

### *6.5.1 Locating Studies*

The main limitation of this meta-analysis is that only journal articles were included. Smith (1980) found that effect sizes varied greatly depending upon how studies were presented. It is not clear whether generalizations about the state of research knowledge on nursing health assessment based on the review of journal articles can be made. For example, if an unpublished study by Montgomery (1990) had been included in the comparison of the use of physical assessment skills between different countries it is doubtful that the first hypothesis would have been supported.

### *6.5.2 Selection of Appropriate Studies*

Another disadvantage of using journal articles is the limitation on the amount of information that can be presented. Although a journal article is essentially a summary of the study it may not provide adequate descriptions of research elements desirable for a meta-analysis. Only 16 of the 65 located studies were selected for analysis. The most common reason for excluding studies was that nursing health assessment was neither defined nor implied.

### 6.5.3 *Treatment of Studies*

In order to compare the findings of primary studies two major assumptions were made during their treatment that were not anticipated at the beginning of the study.

The first assumption was that studies were sufficiently comparable. This assumption was made because of the lack of information presented in the journal articles, the small number of studies available and controversy concerning whether studies should be weighted. The primary studies all used convenience sampling. Despite experience in nursing acknowledged as a factor influencing nurses' performance it was not described in many of the primary studies. Different instruments were used and although pilot studies were undertaken by several researchers estimations of reliability and validity were given in only one study (Wingate & Lackey, 1989). The reliability and validity of this meta-analysis is, therefore, in doubt.

The second assumption concerns the normal distribution of scores. This assumption was used in two ways. In an attempt to compare the use of physical assessment skills between sophomore nursing students and registered nurses the percentage of students was calculated using a method of best fit. The raw scores were assumed to be distributed normally about the mean in order to use a Z score. The assumption of normal distribution was later used to compare the scores of nurses



receiving formal education through a Paired-Comparison Student's t-Test. Chi-square analysis could not be used because the groups were not independent.

## 6.6 IMPLICATIONS FOR NURSING

The findings of this study are relevant to nursing practice because all nursing intervention should be based upon assessment. The results of this study indicate that nursing health assessment is different in varied clinical settings. This suggests that nurses are responsive to varying conditions and client needs. The tools for documenting nursing health assessment should, therefore, be devised specifically for each clinical setting or sufficiently flexible to account for differences in assessment priorities. Methods of evaluating the quality of nursing practice should also take these differences into account.

Although, ideally comprehensive nursing health assessments would always be undertaken, nursing education should prepare nurses for real situations. That is, nurses should learn how to focus health assessments with the clients' health status and nurses' roles in mind.

No global definition of nursing health assessment could be elucidated from the primary studies that were reviewed. No theory concerning nursing health assessment could, therefore, be based on these studies. Furthermore, the results of this meta-analysis suggest a

reluctance of researchers to address nursing health assessment as a global concept and employ frameworks previous advocated by nursing theorists.

## 6.7 RECOMMENDATIONS FOR FUTURE RESEARCH

Meta-analysis techniques are useful where researchers use clear, consistent definitions; employ reliable, valid measurement techniques; consider all confounding variables and adequately report all elements of the research process. The conclusions drawn from this meta-analysis were limited because of failings in all these areas.

Although the importance of nursing health assessment was discussed in many primary studies over one quarter of located studies failed to define or imply its meaning. Without clarification and agreement as to what constitutes a nursing health assessment there are no means for determining the validity of instruments that seek to measure it. Furthermore, there is no basis for comparing studies.

The lack of consensus on the definition of nursing health assessment was anticipated by the investigator. The difficulties encountered during the study emphasize the need for a broad definition of the dependent variable in a meta-analysis in similar circumstances. Qualitative research methods, however, should be undertaken to uncover the meaning of nursing health assessment prior to further

attempts to quantify influencing factors. This need for qualitative research was highlighted in the primary studies when it was discovered that a major reason for physical assessment skills not being used was they were not considered relevant or a nursing responsibility by participants (Colwell & Smith, 1985; Jarvis, 1983).

The Object Content Test employed by Wingate and Lackey (1989) may also be a useful instrument for determining nurses' perception of nursing health assessment. It is an unstructured, self-administered test which seeks to describe social objects and self by asking "What is \_\_\_?" Test-retest reliability coefficients have reportedly ranged from 0.38 to 0.85 (Wingate & Lackey 1989, p219). Common attitudes and beliefs may be uncovered by asking nurses "What is a nursing health assessment".

Colwell and Smith (1985) devised a structured questionnaire to seek the attitudes and behaviours of nurses in regard to physical assessment skills. Although they did not report reliability and validity for the instrument, the list of possible responses appeared comprehensive and generated a substantial amount of useful information. Attempts to establish its reliability and validity should be undertaken so that similar studies can be undertaken and compared.

As previously stated, many researchers failed to sufficiently

describe all the elements of their studies. Difficulties encountered during this study emphasize the need to use as many sources for locating studies as possible. It also emphasizes the need for improved descriptions of research studies in journal articles. Descriptions adequate for a meta-analysis are also essential for determining the applicability of research findings.

## CHAPTER 7

### CONCLUSION

The purpose of this study was to determine the effect of clinical setting, year of assessment, nursing education and experience in nursing on the scope of nursing health assessment using meta-analysis techniques. A significant difference was found in the scope of nursing health assessment in varied clinical settings ( $p < 0.001$ ), however, no significant difference was found between years of assessment. The effect of nursing education remains unclear due to conflicting results in the analyses. The effect of experience in nursing was not determined because it was inadequately described in the primary studies that were located.

Only tentative conclusions could be drawn from the results due to the limitations of the study. The convenience sample of primary studies extracted only from journal articles may not have been representative of all studies on the subject. Added to this, convenience samples used in the primary studies cast doubt as to whether their findings are representative of the nursing population. The comparison of only two studies is admissible in a meta-analysis (Mullen & Rosenthal, 1985), however, the total number of primary studies addressing nursing health assessment remains unknown.

Broad definitions were used to locate primary studies. Only 16 of the 65 located studies were selected for analysis. Selected studies were grouped for analysis on the basis of using the narrowest possible definition of variables. It remains doubtful, however, whether these studies were sufficiently comparable for analysis. Many studies lacked adequate descriptions of elements of the research process including definition of variables and the control of influencing factors. The 16 selected studies differed in samples, settings and instruments. Only one study used an instrument that had been tested for reliability and validity. The reliability and validity of the meta-analysis is, therefore, in doubt. Nevertheless, the findings of this study have implications for nursing practice, education, theory and research.

The diversity of approaches used in the primary studies emphasizes a lack of communication and coherence amongst nurse researchers. One purpose of a meta-analysis is to explicate the state of knowledge about a given subject. In this meta-analysis it was found that, in general, the state of knowledge about nursing health assessment is chaotic. Qualitative research methods aimed at uncovering nurses' perceptions of nursing health assessment should be undertaken prior to further attempts to quantify possible influencing factors. Equally important is that descriptions of research studies need to be improved in journal articles to enable nurses to use their findings.

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