# MEASURING THE OUTPUTS OF NURSING RESEARCH AND DEVELOPMENT IN AUSTRALIA: THE RESEARCHERS

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## ABSTRACT

**It is vital for nurses to publish in order to provide evidence of their practice and to increase the knowledge base of their discipline. This paper is one of two that reports on an investigation of the nursing research published by Australian authors from 1995-2000 in 11 nursing journals based in Australia, the UK and the USA. The focus of this article is on the researchers drawn from a total of 509 articles that were content analysed and categorised according to topics of research, paradigm, methods used and funding acknowledgment. The researchers were analysed on the basis of gender, discipline, employment base and location.**

**Publications had from one to 10 authors, averaging two, with 26 authors claiming 23.6% of research articles. The most common discipline area was nursing and universities were the leading area of employment. Authorship was not limited to capital cities reflecting the spread of university campuses in rural areas. Research papers made up 12.5% of possible articles, supporting the notion that few nurses publish research papers in the refereed general nursing journals we focused on.**

## INTRODUCTION

The practice of nursing can no longer be ritualised with no rationale for practice provided (Walsh and Ford 1992). Researching nursing effectiveness and using the results of such research in practice is increasingly important as governments and national associations are basing the distribution of limited resources on evidence based care (Chalmers 1993). Knowledge of current research is a precursor of evidence based practice (Wallace et al 1997). Systematic reviews of the literature are one way of providing knowledge of current research as a precursor to evidence based practice. However, systematic reviews require nurses to disseminate their research findings before they can be used to improve clinical practice. We report a study of nursing research published by Australian authors from 1995 to 2000 in 11 nursing journals. While a number of factors were investigated such as the actual topics of the research, the paradigms and methods used, the researchers and sources of funding, this paper will present a profile of the researchers.

## LITERATURE REVIEW

The impetus for the current study came from a project conducted in the United Kingdom (UK), *Measuring the Outputs of Nursing Research and Development* (Rafferty et al 2000). This UK study investigated the type of nursing research being published with particular interest in the topics of research, funding and publication during the period from 1988 to 1995, using the UK Research Outputs Database (ROD). The most prolific geographic areas of publication identified were from authors in the cities of London and Manchester, and only a third of the research appeared to be funded (Rafferty et al 2000; Traynor and Rafferty 2000). Further, the research was extremely diverse with 50 subject areas identified. The leading two in terms of output were mental health (337, 18%) and nurse education (268, 15%). Rafferty et al (2000) suggested topics reflecting clinical care had tended to grow over the period studied.

There is considerable discussion and research in the literature on why nurses should publish and read research, which nurses do or do not read and/or publish research, and, what topics they pursue (Dunn 1991; McConnell and Paech 1994; Hicks 1995; Jackson et al, 1996; Smith 1996). Both government and the profession have emphasised the importance of effective dissemination and implementation of research findings (Mulhall 1996). It has been stated that 'A body of written knowledge is crucial to the establishment of a discipline' (Goody 1977, p.50). Thus, publication is the primary means of communicating research, practice and theory and is essential for the recognition of the individuals within it and of the discipline as a whole.

Published work alone does not constitute a discipline and scholarship. Unpublished work and informal exchange also contribute to the development of knowledge. However, these cannot be widely assessed and critically appraised and neither do they qualify as the 'public knowledge' which is the core of a discipline and its scholarship (Ziman 1968). As well, it can be considered unethical not to publish research results as the projected publication of results is part of the approval of research by ethics committees (Blunt et al 1998). For these reasons it is crucial for nurses to circulate research findings in the quest of scholarship and excellence in practice (Mulhall 1996). As suggested by Styles (1978, p.28) 'not to publish is enacting nothingness in a part of one's professional soul'.

Nurses publish in a range of venues from newspaper articles, reports, conference papers and peer-reviewed articles and books. However, many of the papers and articles in the nursing press are written by a small number of people (Mulhall 1996). Hicks (1992) found that the level of publication of research in the United Kingdom (UK) nursing population was low with only 3% of nurses promulgating their findings in national academic and professional journals. In a later study based on a national survey of 230 nurses in the UK, she discovered that only 10% of the 161 nurses who conducted research submitted it for publication (Hicks 1995). She also found the authors were more likely to be managers than clinicians, be nurses with post basic qualifications and aged between 21-30 years. These findings are interesting, as it has been found that the theses of postgraduate nurses are unlikely ever to be published (Mulhall 1996).

In the same period, in the UK, nursing was the fastest growing of 25 health related fields in the ROD (Rafferty et al 2000; Traynor and Rafferty 2000). In a study on the other side of the Atlantic, Winslow (1996) searched the databases of MEDLINE and CINAHL and found that of 40 abstracts published and presented at the American Association of Critical Care Nurses National Conference in 1989, only 37.5% had been subsequently published as full journal articles by 1995. Data on published and unpublished research conducted by Australian nurses has been compiled by the Royal College of Nursing, Australia (RCNA) in the last decade (RCNA 1998) but a systematic analysis has not been conducted.

A number of studies have examined trends surrounding publication by nurses in Australian refereed journals at different times in history since the late 1980s (Daly 1990; McConnell and Paech, 1994; Jackson et al 1996; Roberts 1997). In his study, Daly (1990) found that research was the least represented area of publication in Volumes 1, 3 and 5 of the *Australian Journal of Advanced Nursing (AJAN)* between 1983 and 1988. McConnell and Paech (1994) compared outputs in Volumes 1-4 and 5-8 of the *AJAN* and found little significant difference although there appeared to be a trend towards more clinically focused articles and an increase in 'clinician authors'. In a survey of Australian nurse academics, Roberts (1997) found that 7% had published in refereed journals between 1993 and 1994. Of these, 26% were male although only 17% of nurse academics are men.

Jackson et al (1996) reviewed the content of four Australian refereed nursing journals: *Australian Journal of Advanced Nursing, Contemporary Nurse, Nursing Inquiry* and *Collegian* over the nine-month period, September 1994 to June 1995 and categorised this content according to subject matter and authorship by gender and discipline (Jackson et al 1996). Their findings indicated that articles pertaining to clinical practice, the practice of research, and professional nursing issues were well represented. They also noted a marked increase in the number of refereed Australian nursing journals since 1992 at which time there was only one. In reviewing the available literature on Australian authors it is of concern that Jackson et al (1996) found less than 50% of articles were generated by clinician authors, although they found over 30% were joint publications between academics and clinicians.

All three of the abovementioned investigations explored the content of articles while the aim of the present study was to generate a detailed account of research published by Australian authors. Refereed research articles were analysed from 11 nursing journals. The data included: number, gender, discipline base, place of employment and geographic location of authors as well as an indication of research interests.

## METHOD

The present study involved a quantitative approach using content analysis in order to describe information found within refereed research article abstracts on the characteristics of the authors.

### Selection of journals

In order to ensure information documented would accurately represent nursing research and development produced from Australia, 20 refereed nursing journals were selected from publishing bases in: Australia (A), United Kingdom (UK), the United States of America (USA), and Japan, for the years January 1995 to December, 2000. This list included: *Advances in Nursing Science* (USA), *Australian Journal of Advanced Nursing* (A), *Australian Journal of Critical Care Nursing* (A), *Australian Journal of Holistic Nursing* (A), *Australian Journal of Rural Health* (A), *Collegian* (A), *Contemporary Nurse* (A), *International Journal of Nursing Practice* (A), *International Journal of Nursing Studies* (USA), *Journal of Advanced Nursing* (UK), *Journal of Clinical Nursing* (UK), *Journal of Continuing Education in Nursing* (USA), *Journal of Nursing Education* (UK), *Journal of Nursing Administration* (USA), *Nurse Education Today* (UK), *Nursing Inquiry* (A), *Nursing and Health Science* (Japan), *Professional Nurse* (UK), *Research in Nursing and Health* (USA), *Western Journal of Nursing Research* (USA) and *Nurse Education Today* (UK). Journals found to contain less than 10 research articles from Australian authors in the time period January 1995 to December 2000 were not used. Thus articles from 11 journals were included in the final analysis.

### Article retrieval

Two supervised student researchers based in Sydney and Adelaide, respectively, collected the data. Coordination and consistency of data collection and entry for the project was maintained through extensive email and telephone contact. Two methods of article retrieval were used in the study. In Adelaide, a manual search of journals was conducted and refereed articles were chosen by reading abstracts to verify their research basis and Australian authorship. All abstracts including authorship details were photocopied. In Sydney, the journals were accessed on line through the databases CINAHL and MEDLINE (1995-2000), for reference details and abstracts. The use of online databases for this type of content analysis was used for the earlier studies in the UK (Rafferty et al 2000) and in Australia (Jackson et al 1996). Lists of all articles published by each journal were printed out and the reference details were used to select articles that contained at least one Australian author. These articles were then printed and perusal of abstracts identified whether or not the articles pertained to research. More detailed author information (where two or more authors were cited) was retrieved using full text options within the electronic databases or by conducting a manual library search.

In order to verify the inter-reliability of the two methods used to select journals, a comparison of the research articles retrieved from the *AJAN* was conducted. There were 93 articles found by the electronic method and 92 from the hand sort, which represented an error of 1%.

### Data collection

The Statistical Package for Social Science (SPSS) Version 10 was used to create a template for data collection according to the broad list of variables. These included journal source, year of publication and classification of research topic. Gender was assigned according to the author's first name when available. When cited, data were collected on discipline base, place of employment and geographic location of authors. Each variable contained a number of categories by which each article was coded.

### Data analysis

Coded categories for each variable were tallied and descriptive analysis processed with frequencies, means, medians and standard deviations calculated. Results were tabulated for comparison, while cross tabs between selected variables were examined to determine relationships.

## RESULTS

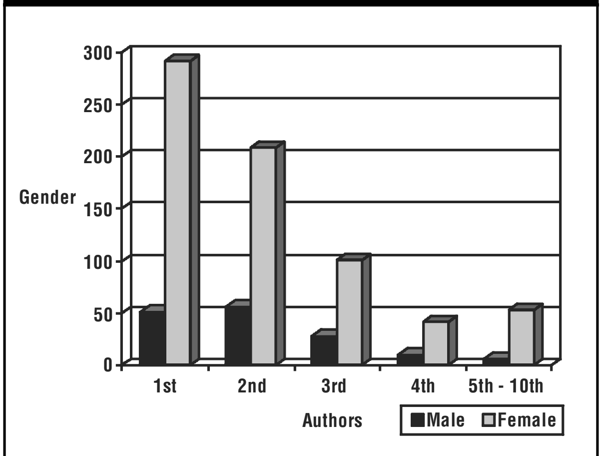
Journals used in the final analysis were limited to those that contained 10 or more articles with at least one Australian author since the journals accessed were from general nursing journals and not specialist journals. Selection of Australian authorship was determined if the author's contact details were based in Australia. Of the journals analysed, seven were Australian based and four were located in the UK. The final selection of journals was: *Australian Journal of Advanced Nursing* (A), *Australian Journal of Critical Care Nursing* (A), *Australian Journal of Holistic Nursing* (A), *Collegian* (A), *Contemporary Nurse* (A), *International Journal of Nursing Practice* (A), *International Journal of Nursing Studies* (USA), *Journal of Advanced Nursing* (UK), *Journal of Clinical Nursing* (UK), *Nurse Education Today* (UK) and *Nursing Inquiry* (A).

A total of 509 refereed research articles were analysed representing 12.5% of the possible 4062 articles published by the journals used in the final analysis as shown in table 1. Over 60% of the articles analysed were from Australian journals. The three major journal sources of the research articles were the *AJAN* (93 articles, 18.3%), *Journal of Advanced Nursing (JAN)* (92, 18.1%) and *International Journal of Nursing Practice (IJNP)* (73, 14.3%).

The 509 articles analysed were by a total of 1112 authors. The number of authors per paper ranged from one to 10 with one or two authors being the most common. The mean number of authors per paper was 2.18. Figure 1 depicts the number of authors where gender could be determined in order of authorship. As shown in the figure

| Table 1: Number of research articles with Australian authors in journals accessed (A=Australian, UK=United Kingdom) Total number of refereed research articles n=509 | | | |
|---|---|---|---|
| Journal name | Total articles 1995-2000 | Research articles with Aust. author n | % |
| Australian Journal of Advanced Nursing (A) | 164 | 93 | 57 |
| International Journal of Nursing Practice (A) | 205 | 73 | 36 |
| Contemporary Nurse (A) | 209 | 58 | 28 |
| Aust Journal of Critical Care Nursing (UK) | 182 | 40 | 22 |
| Collegian (A) | 216 | 45 | 21 |
| Nursing Inquiry (A) | 206 | 27 | 13 |
| Nurse Education Today (UK) | 175 | 21 | 12 |
| International Journal of Nursing Studies (UK) | 289 | 22 | 8 |
| Australian Journal of Holistic Nursing (A) | 250 | 19 | 8 |
| Journal of Advanced Nursing (UK) | 1802 | 92 | 5 |
| Journal of Clinical Nursing (UK) | 364 | 19 | 5 |
| **TOTAL** | **4062** | **509** | **12.5** |

**Figure 1: Gender of authors and co-authors for research articles**




| Table 2: Discipline and area of employment of authors and co-authors for research articles | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Author origin | 1st author n | (%) | 2nd author n | (%) | 3rd author n | (%) | 4th author n | (%) | 5th-10th author n | (%) |
| **Discipline** | | | | | | | | | | |
| Nursing | 403 | (83.6) | 202 | (72.4) | 103 | (73.0) | 40 | (75.5) | 50 | (83.3) |
| Health Science | 27 | (5.7) | 9 | (3.2) | | | | | | |
| Student | 13 | (2.7) | 2 | (0.7) | 1 | (0.7) | | | | |
| Medicine | 11 | (2.3) | 17 | (6.1) | 15 | (10.6) | 3 | (5.7) | 2 | (3.3) |
| Education | 6 | (1.2) | 12 | (4.3) | 4 | (2.8) | | | | |
| Midwifery | 6 | (1.2) | 4 | (1.4) | 2 | (1.4) | 2 | (3.7) | 1 | (1.6) |
| Psychology | 5 | (1.1) | 8 | (2.9) | 2 | (1.4) | 1 | (1.9) | | |
| Social Work | 3 | (0.6) | 1 | (0.3) | | | | | | |
| Management | 3 | (0.6) | 4 | (1.4) | 1 | (0.7) | 1 | (1.9) | 2 | (3.3) |
| Other | 2 | (0.4) | 7 | (2.5) | 2 | (1.4) | 1 | (1.9) | | |
| Communi-cation | 1 | (0.2) | | | | | | | | |
| Occupational Therapist | 2 | (0.7) | 1 | (0.7) | | | | | | |
| Pharmacy | 1 | (1.9) | 1 | (1.6) | | | | | | |
| Sociology | 5 | (1.8) | 3 | (2.1) | 1 | (1.9) | | | | |
| **Total** | **482** | **(100)** | **279** | **(100)** | **141** | **(100)** | **53** | **(100)** | **60** | **(100)** |
| **Area of employment** | | | | | | | | | | |
| University | 343 | (69.7) | 181 | (63.7) | 78 | (54.9) | 25 | (49.0) | 17 | (28.8) |
| Health | 105 | (21.3) | 86 | (30.2) | 53 | (37.3) | 21 | (41.1) | 32 | (54.2) |
| University and health | 37 | (7.5) | 14 | (4.9) | 10 | (7.0) | 4 | (7.8) | 10 | (16.9) |
| Other | 7 | (1.4) | 3 | (1.0) | 1 | (0.7) | 1 | (1.9) | | |
| **Total** | **492** | **(100)** | **284** | **(100)** | **142** | **(100)** | **51** | **(100)** | **59** | **(100)** |

of the total of 845 authors, 151 (17.8%) were male; and of these 51 of 342 (14.9%) were first authors. It is of interest that further analysis (data not shown) elucidated that of the first and second authors 26 researchers were cited more than three times with one researcher having 12 publications. Of these more prolific authors, six were men and seven held a joint appointment between a hospital and university. The total research papers by these 26 authors acting as first or co-authors was 120, ie 23.7% of the 509 research articles found in the study.

If available in citation, the discipline or field of study of the authors were tallied and tabulated as shown in table 2. The most common discipline of the first author was 'nursing' (403, 83.6%) with 'health science' (27, 5.7%) and 'student' (13. 2.7%) following in order. Medicine was the discipline of the first author in 11 (2.3%) of the cases. These percentages are calculated on the 482 first authors on which the information was available.

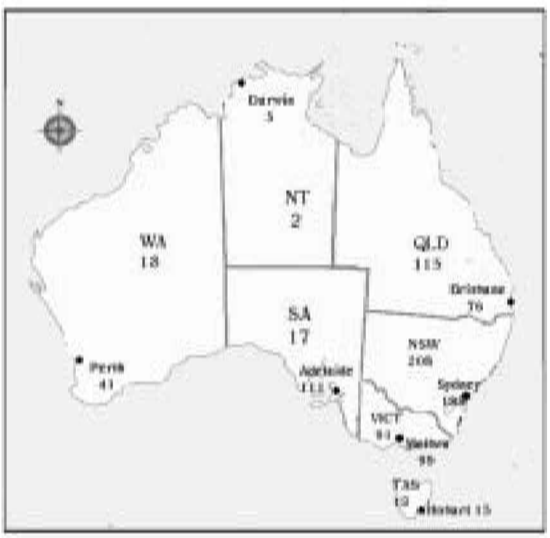
The top 10 research interests of the authors which were determined from citation details were education of nurses (95, 18.7% of major topics of articles analysed), practice issues (78, 15.3%), professional issues (46, 9.0%), aged care (28, 5.5%), occupational health (22, 4.3%), acute care (21, 4.1%), service delivery (18, 3.5%), research issues (18, 3.5%), mental health (17, 3.3%) and maternal and infant care (17, 3.3%).

When examining the paradigm in which the research was conducted of the 495 cases in which this was cited 203 (41.0%) were quantitative, 230 (46.5%) were qualitative and 62 (12.5%) were a mix of quantitative and qualitative methods (data not shown). When a cross tab of discipline or field of study of the first author of article and paradigm was conducted there was a similar ratio of quantitative to qualitative methodology if the discipline area was nursing. However, if psychology or medicine was the discipline area of the first author there appeared to be a preference for quantitative methods (80% and 64% of articles respectively).

The area of employment of the authors was tallied and tabulated if acknowledged in the publication (table 2). It can be seen that the most common place of employment was a university (644, 62.5% of total authors cited) followed by authors employed by health organisations (297, 29.0%). Authors with joint appointments between university and health organisations comprised 75 (7.3%) of the total.

The geographic locations of the Australian based authors for which the information was provided are displayed in figure 2. The number in each capital and the rest of the state are depicted. Most authors came from New South Wales (38.7%), followed by Queensland (18.7%), Victoria (18.6%) and South Australia (12.5%). This trend is similar to the first authorship with 36.2% from NSW, although 21.9% came from Victoria, 17.9% from Queensland and 13.4% from South Australia. Twenty four authors (2.3%) were from the UK, USA, Canada or Asia. Of these, three were first authors.

**Figure 2: Location of authors**




## DISCUSSION

While it needs to be remembered that this study did not examine specialist nursing or medical journals, it has confirmed the evidence from previous research in Australia that few nurses, even if they are academics, are publishing research papers in refereed general nursing journals (Daly 1990; Jackson et al 1996; Roberts 1997). Only 12.5% of the possible articles in the journals examined were based on research. The data tend to reflect that the publication output of nurses may be even lower than other disciplines.

It is suggested in the literature in the UK (Mulhall 1996) that much of the published material in nursing literature is produced only by a few. In an Australian study of academics, Ramsden (1994) found that publications rates were variable with most publications being the work of a minority of staff. This is confirmed in this study with 26 authors publishing 23.6% of the research articles.

The historical trend that most authors of published articles come from the university sector continues in this study (Daly 1990; McConnell and Paech 1994; Jackson et al 1996). It has been suggested that joint professorial appointments between hospitals and universities provide a means of addressing the lack of research publication in nursing (Dunn and Yates 2000). However, this study has shown that joint appointees account for only 7.3% of all articles analysed. Nevertheless they were identified as seven of the more prolific 26 researchers who were first or second author in 23.7% of articles. While these appointments are bringing the stakeholders, ie the academics and clinicians together, more work and appointments are needed before full evaluation of these positions in enhancing research publication can be made.

In her article, Dunn (1991) indicated that most of the clinical professors in their study felt a crucial component of their role was to involve clinicians in research publication. As well Megel et al (1998) suggest that high producers of nursing research publications in the US spent more time on research and writing than on teaching and that publication increased after a doctorate was obtained. This needs to be investigated in the Australian context. Actual data on the submission of research articles to journals by Australian nurse researchers are not available so the issue of rejection rates by individual journals cannot be estimated although it may be a factor to consider in analysing actual researcher output.

In the UK study by Rafferty et al (2000) the *JAN* was rated as the journal with the most influence on practice and in this study it was seen to be favoured by Australian authors along with the *AJAN*. The propensity to publish in *AJAN* may reflect the trend reported by Nagy et al (1992) that the most highly rated journals RNs used to source for information were the *AJAN* along with the *Australian Journal of Critical Care*.

It is difficult to draw conclusions from the geographic location of authors. However, it is of interest that authorship is not in any way limited to capital cities and reflects the spread of university campuses in rural and metropolitan areas (figure 2). Given the relative size of its population, South Australia appeared to do well in terms of authorship. This may however be a reflection of the location of three universities in Adelaide, each of which has a school or department of nursing.

Similar to Rafferty et al's (2000) study in the UK, this study has revealed that the majority of the articles were authored by one or two people (figure 1). A lack of interdisciplinary collaboration has been the norm in nursing which has drawn criticism as an introspective discipline (Marquis et al 1993). However, as displayed in table 2, there is an indication that collaboration across other disciplines is developing, particularly with colleagues in health science, medicine and psychology.

## CONCLUSION

This study has shown that publication of refereed research articles by Australian nurses is low in relation to the total articles in the journals analysed. As a profession and discipline, nurses need to publish their research in order to improve standards of nursing practice. If nurses do not share their knowledge the body of nursing knowledge is not enhanced while others may expend time and resources repeating research unnecessarily. In this era of evidence based practice, knowledge that is generated from research is regarded as imperative. While other forms of nurse publications are vital, this study recognises the value of research as a major contribution in developing and improving nursing standards of practice. For practitioners to utilise and implement such knowledge it must be widely disseminated and in journals that are easily accessible and readable.

This study was limited in that it only examined general nursing journals and most of the journals finally analysed were Australian based. It would be useful to survey the authors to determine why they choose particular journals for their publication and how often they are rejected by individual journals.

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