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# Patient education and consumer medicine information: a study of provision by Queensland rural and remote area Registered Nurses

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**Patient education and consumer medicine information: a study of provision by Queensland rural and remote area Registered Nurses**

**Aims and objectives.** The aim of the larger study was to ascertain the medication practices of registered and enrolled nurses in rural and remote areas of Queensland after the introduction of the Health (Drugs and Poisons) Regulation. This paper reports on the findings of the role of registered nurses and their confidence in the ability to provide information on medications in a way that the client understands; the frequency of the provision of information to clients prior to discharge; and the frequency of Indigenous Health Workers or interpreters for people without English as a first language.

**Background.** Queensland employs approximately 17% of the Australian registered nurse workforce. In 1996 Queensland changed the Health (Drugs and Poisons) Regulation to allow specific registered nurses, who had undertaken approved postgraduate education and training programmes, to become endorsed for an expanded medication practice role. In particular, it allowed endorsed nurses to administer and supply (but not prescribe) drugs listed in a drug formulary to certain clients using protocols. It was not clear, however, whether the changes to the Regulation reflected the scope of practice, thereby providing adequate legal protection for the nurse.

**Design.** During 2001–02 an exploration of the medication practices of rural and remote area nurses was conducted by the use of a cross-sectional postal survey.

Phase 1 of the study used a facility audit to ascertain facility medication practices and phase 2 of the study used a postal survey to ascertain nurses' medication practices.

**Method.** All nurses employed in rural and remote health facilities in Queensland were eligible to participate in the study. The nurse registering authority's (the Queensland Nursing Council) register was used to generate a non-proportional stratified random sample. Of the 1999 questionnaires sent, there were 668 respondents. Of these, 520 were registered nurses.

**Results.** The data indicated that there was a difference between endorsed and unendorsed registered nurses' medication practice. In particular, it was apparent that endorsed registered nurses were more likely to believe they could explain the side-effects of medication to clients in a way the patient understood; provided medication education to clients on discharge; and used Indigenous Health Workers or interpreters to explain medications to those clients for whom English was not a first language. However, it was apparent that < 50% of all Registered Nurses were providing client medication education or using Indigenous Health Workers or interpreters.

**Conclusion.** It is apparent that the changes to the Regulation have ensured that Registered Nurses who have undergone postgraduate education to enhance their medication practice are more likely to provide client education and consumer medication information. However, the results suggest that the majority of registered nurses in Queensland, whilst believing they have sufficient knowledge of pharmacology to provide client education, often do not provide appropriate medication advice to clients, particularly on discharge from the acute setting.

**Relevance to clinical practice.** It is well recognized that the provision of medication education to clients has several benefits to both the client and the health care system. The lack of client medication education indicated in this study compromises patient's safety as well as their compliance with their medication regime.

**Key words:** medications, rural nursing, remote area nursing, client medication, education, advanced practice

## Introduction

In 2001 in Queensland, the third most populated State in Australia, there were 28 381 Registered Nurses (RNs) employed (Australian Institute of Health and Welfare 2003). This constituted approximately 17% of the national RN workforce. Similar to other countries, Queensland has mainly a female nursing workforce (92%) of which 54% are employed part-time. While figures are not available on the percentage of RNs who work in rural and remote areas of Queensland, nationally, 31% of RNs work outside the capital cities.

Due to the low population densities and lack of medical and allied health professionals, health service delivery in rural and remote areas of Queensland, similar to the rest of Australia and internationally, is highly dependent upon the nursing workforce (Rennie *et al.* 2000, Bushy 2002). There have been several previous studies which examined the role and function of rural and remote RNs in Australia (Kreger 1991,

D Hegney, University of Southern Cross, Lismore, unpublished PhD thesis, Hegney *et al.* 1997), Canada (Rennie *et al.* 2000), New Zealand (Ross 1999) and the US (Bushy 2002). All of these studies found that rural and remote RNs work in an expanded practice role. An integral part of this expanded practice role is the administration and supply of medications (Hegney *et al.* 1997, Hegney 1997, McCann & Baker 2002).

Similar to nurses in other States and Territories of Australia, until the changes to Queensland's Health (Drugs and Poisons) Regulation in 1996 (Queensland Government 2003), many of these rural and remote area RNs were working outside the legislation with regard to the administration and supply of medications (Kreger 1991, Hegney *et al.* 1997). In particular, nurses were often supplying controlled (Schedule 8) and restricted (Schedule 4) drugs without a verbal or written prescription from a medical practitioner, usually because the medical practitioner was not available (Hegney *et al.* 1997, Hegney 1998, McCann & Baker 2002).

An important new role for nurses in Queensland, as a result of the Regulation, was the ability of accredited (called endorsed) RNs to administer and supply medications. This ability was limited to the drugs named in protocols (called Health Management Protocols) and listed in a drug formulary (called a Drug Therapy Protocol). The Regulation did not allow, however, for nurses to work as nurse practitioners nor to prescribe from the Drug Therapy Protocol. This new role was at first limited to RNs employed in designed remote areas of Queensland (called isolated practice areas), and RNs working in sexual health and immunization. However, the Regulation has since been amended to include RNs working in rural hospitals as well as in isolated practice areas (Queensland Government 2003). It was not apparent, however, whether the changes to the Regulation provided adequate legal protection for the expanded role of rural and remote area RNs. Nor was it clear that patient education was adequately supported within this legitimated expanded role.

It is well recognized internationally that the provision of medication education to clients has several benefits to both the client and the healthcare system (Alibhai *et al.* 1999, Saounatsou *et al.* 2001) as educated clients are capable of making informed decisions, thus increasing feelings of control, self-determination and autonomy (Edwards 1995, Rycroft-Malone *et al.* 2001, Haynes *et al.* 2004). Moreover, adequate knowledge of medications has been shown to decrease re-presentations due to either a lack of understanding of the medications or from side-effects of the medication (Merkatz & Conig 1992, Alibhai *et al.* 1999, Henderson & Zernike 2001). Alibhai *et al.* (1999) argue that medication education prior to discharge is particularly important, as medication regimes are often changed during hospitalization.

It is also well recognized internationally that nurses have an important role in the provision of education to clients with regard to medications. Several studies have been undertaken to ascertain how best to provide this information (Hallstrom & Elander 2001, Moumjid *et al.* 2003). In both of these studies, the authors suggested that nurses must not only ascertain what information a client requires, but also have the ability to provide the information in a way the client understands.

## Method

### Aims and objectives

The aim of the main study was to ascertain the level of medication practices of registered and enrolled nurses (EN) in Queensland after the introduction of the Regulation. In particular, it gathered data from nurses employed in rural

and remote areas of Queensland during 2001 and 2002. The results of the main study have been reported elsewhere (Hegney *et al.* 2003).

This paper provides the results related to five quantitative questions within the larger study. Two questions asked nurses to indicate on a five-point Likert scale where 1 was 'always' and 5 was 'never': the frequency of how often they (i) provided medication information to clients prior to discharge (including consumer medicine information, CMI); and (ii) used interpreters or Indigenous Health Workers (IHWs) when administering or supplying medications to explain the medications to those clients who did not have English as a first language.

Three further questions were asked: my knowledge of medications and how they work is adequate for my current level of practice; I am able to explain to my patients, in terms they can understand, how the medications they receive work; and I am able to explain to my patients, in terms they can understand, the major side-effects of the medications they receive. Data were gathered from respondents using a five-point Likert Scale where 1 was 'strongly agree' and 5 was 'strongly disagree'.

### Study design

The study was carried out in two phases. Phase 1 involved purposive sampling of facilities aimed at capturing the range of current medication practices in health facilities across rural and remote Queensland. After reminder calls, eight of 12 facilities returned completed audit forms, a response rate of 67%. The results of phase 1 were used to inform the questionnaire used in phase 2. The pool of potential items for the questionnaire was generated in similar ways to those for the audit, i.e. by reference to the literature and from the experiences of the members of the Project Team who suggested additional areas of investigation. Data analysis of phase 1 also highlighted some further areas to be included in the questionnaire. For example, the reported lack of patient education (including the use of CMI) and the use of interpreters or IHW for people whose first language was not English. The questionnaire was assembled and reviewed several times by the Project Team, as well as being peer reviewed by the nurse registering authority (the Queensland Nursing Council, QNC) and selected rural nurses in the Toowoomba Health Service District.

### Population and sampling

The target population for phase 2 of the study comprised RNs and ENs currently registered with the QNC and working in Queensland rural and remote area facilities. The inclusion criteria were nurses:

- 1 working in government and non-government facilities with less than 50 acute beds, including community health facilities, as obtained from the Hospital and Health Service Yearbook (2000);
- 2 with an address in the postcode areas designed as Rural Centres, Other Rural Areas, Remote Centres, Other Remote Areas and Offshore Areas (Department of Primary Industries and Energy 1994).

The target population was divided into four groups as follows (the number in each subpopulation according to the QNC records is in brackets):

- 1 rural and isolated practice-endorsed RNs (RINs) – rural areas (8);
- 2 all other RNs and ENs from rural areas (2739);
- 3 RINs – remote areas (49);
- 4 all other RNs and ENs from remote areas (1372).

The non-proportional stratified sampling scheme adopted for the main study included all 57 RINs in strata 1 and 3 and equal numbers (971) of nurses in strata 2 and 4. This scheme best provided data to enable comparisons to be made between RINs and non-RINs as well as allowing inferences with approximately equal precision to be made for nurses in rural or remote areas.

Nurses selected for the pilot study were excluded from the main study. Of the 1999 questionnaires that were sent, 668 were returned after one reminder package. Of these, 520 were RNs. The response rate was 33%. This number includes questionnaires that were returned but were not usable because of incompleteness. Eight-eight nurses either returned their questionnaires to the research team or declined to participate. Most of those who declined were still registered as nurses but were not in a clinical position, not working as a nurse, or were not working.

## Ethics

The study was approved by the Human Research and Ethics Committee of the University of Southern Queensland. All material sent to participants was posted by the QNC. The Project Team had no access to the names and addresses of the participants. Because a code was written on each questionnaire, the Project Team was able to keep track of non-respondents and send reminder packages to them (via the QNC) three weeks after the initial mail-out.

## Limitations of the research

It should be noted that nurses rather than facilities have been sampled in phase 2 of the study. Therefore the results describe the medication practices of nurses in rural and

remote health facilities across Queensland at the time of the survey (August, 2002). These results do not necessarily coincide with the medication practices of nurses averaged across facilities.

There may be an expectation that some uniformity of practice exists within a particular facility. No account can be taken of this in analysing the data because, within the ethical guidelines of the study, the exact place of work could not be ascertained without threatening to breach the confidentiality of the responses of participants. Bias may exist in some of the results obtained in phase 2 of the study for the following reasons:

- 1 The sampling frame may have differed from the target population at the time of the study because of the practical necessity of assuming the postcode of a participant's address coincided with the postcode of the place of work (and therefore the level of rurality of the facility). Relatively few participants could be expected to not satisfy this assumption; therefore any bias is expected to be small.
- 2 The QNC database on which the sampling frame was based was slightly out of date. In particular, postsurvey adjustment was necessary for the number of RINs in the population. Records in the QNC database were no more than one month old (all nurses are required to re-register by the 30 June each year) relative to the time of the survey. The shortfall in the number of RINs can be explained by the rapid uptake of this endorsement by RNs before the time of the survey. Since RIN participants had a significantly higher response rate than non-RIN participants, the response rate of the RIN participants was used rather than the overall response rate to estimate the number of RINs in the population. Any bias that exists in these figures will not influence within-stratum results but may influence between-stratum results where the relative sizes of the strata are relevant. The potential size of any such bias is small, however, because of the relatively small sizes of the RIN strata compared with the non-RIN strata.
- 3 With an overall response rate of 33%, there is a threat of non-response bias. Where possible, checks have been applied to detect the presence of non-response bias.

## Data analysis

The number in each population stratum (rural RIN endorsed, rural non-RIN endorsed, remote RIN endorsed, remote non-RIN endorsed) at the time of the survey differed from that at the time of establishment of the sampling frames (based on QNC records) from which the participants were randomly selected because of an increase in the number of nurses with RIN endorsement during this time interval. The number in

each population stratum at the time of the survey was estimated postsurvey on the basis of the response to question 1.7 in the survey (which of the following endorsements do you have?) and the pooled response rate of endorsed nurses based on the original QNC figures. This response rate was used in preference to the response rate over all strata because the endorsed and unendorsed response rates differed significantly, endorsed nurses responding at a higher rate (58%) than unendorsed nurses (32%).

Weights based on the postadjusted figures were incorporated into the analysis and used where appropriate in estimating population parameters within and between groups of respondents aggregated across strata [e.g. groupings by nurse designation (RN/EN) or public/private employment]. Inferential analysis involving such groups were dealt with using the hierarchical log-linear analysis routine in SPSS (version 11.0) (SPSS Inc., Chicago, IL) with stratum incorporated as a factor and by using custom-written routines in R (version 1.2.2) (R. Foundation for statistical computing, Vienna, Austria) and Excel (version 2000).

Analyses within and comparisons between strata did not need to take account of strata weightings and were performed using SPSS. The chi-square test of independence was used to compare proportions for dichotomous variables and ordinal-scaled variables. Categories were collapsed as appropriate to ensure sufficient numbers to preserve the integrity of this test. Differences in median responses on ordinal-scaled items were assessed using the Mann-Whitney or Kruskal-Wallis tests.

Based on the estimated proportions of nurses holding RINs in each of the rural and remote populations, one randomly chosen respondent from the rural RIN stratum and nine randomly chosen respondents from the remote RIN stratum were added to the rural non-RINs and remote non-RINs strata respectively to generate random samples of rural and remote area nurses. No bias is introduced using this approach rather than a more rigorous weighted approach, and any loss of precision is small because of the small proportion of RINs in each population. The advantage of this approach is simplification in the analysis.

Except for comparisons involving RINs only, to protect against type 1 errors, in view of the considerable number of extant comparisons and sample sizes involved, only results significant at the 1% level (two-sided) are reported unless an otherwise non-significant effect is significant at the 1% level in one of the other strata. In these cases a threshold of 5% is used. Although all known RINs were sampled, the small sample sizes involved compromise reliable inference. A 10% significance threshold has been used for comparisons involving RINs to provide a reasonable balance between type 1

and type II error rates. The possibility of false positives is relatively high however for these comparisons.

## Results

### Demographics

Similar to previous studies on the rural and remote nursing workforce (Hegney *et al.* 2002), the rural nurses in this study were older than remote area nurses ( $P < 0.001$ ). For example, 24% of remote area nurses were aged <35 years compared with 13% of rural nurses. In contrast, 12% of rural nurses were aged 55–59 years compared with 7% of remote area nurses. A new finding of this study was that RINs, regardless of geographical location were older than the other nurses in the study ( $P = 0.04$ ).

Ninety-five per cent of the respondents were female. Forty-one per cent were employed as level 1 RNs (at the time of the study there were five levels of RNs in Queensland; level 1 RNs are the most junior of RNs, with Level 5 RNs being Directors of Nursing); 21% as level 2 RNs; and 15% were level 3, 4 or 5 RNs.

### The ability to explain to clients, in a way the client understands, the action of medications

Ninety-one per cent of all nurses in the study believed they were able to explain to their clients, in the terms the client understood, how medications work. There were differences, however, in this belief with RINs from remote areas more likely to believe that they were able to do this than any other nurses in the study, including rurally based RINs ( $P = 0.003$ ). Similarly, 86% of all nurses in this study stated they were able to explain the side-effects of medications to clients. However, RINs were more confident in this role than non-RINs ( $P = 0.003$ ).

### The provision of relevant information to clients including CMI (formally called Consumer Product Information)

In phase 1 of the study, the chart audits indicated that there was no documentation in patient charts with regard to patient education on medications administered. Additionally, on the discharge summary, only 30% of charts audited contained details of client education with regard to their medications. A similar finding was noted in phase 2 data with 34% of nurses stating they 'always' provided education to the client on their medication prior to discharge from the facility. Amongst these 34%, there was strong evidence of a difference between RINs and all other nurses

in the study, with RINs more likely to state they provided medication education to the client prior to discharge ( $P = 0.004$ ).

With regard to the provision of CMI, only 22% of nurses in phase 2 of the study stated they 'always' provided CMI. Fourteen per cent stated they 'never' provided this information. Geographical differences were evident, with remote area nurses (both RINs and non-RINs) more likely to provide this information than rural nurses ( $P < 0.01$ ).

### Use of IHWs or other interpreters for client medication education

In phase 1 of the study, the data suggested that 40% of the charts audited exhibited the use of IHWs for client medication education. A similar result was found in phase 2 of the study with 42% of nurses stating they used IHW or interpreters to explain to their clients how medications work when administering or supplying medications.

### Discussion

Our study set out to ascertain: (i) how confident are RNs in their ability to provide information on medication to clients in a way they understand; (ii) how often do RNs provide information to clients prior to discharge including CMI; and (iii) do RNs ensure that those clients who are disadvantaged due to the lack of understanding of English, receive education that overcomes this barrier?

### RNs' confidence in the provision of medication knowledge to clients

The results of this study indicated that over 86% of respondents believed they had sufficient knowledge of medications, how they worked within the body and the side-effects of medications that they could explain this to clients in a way the client would understand. These findings are consistent with some previous international research (Coombs *et al.* 2003) but inconsistent with others (Rycroft-Malone *et al.* 2001).

A new finding of this study is that RNs who had undertaken further education in the form of the rural and isolated endorsement programme, were more likely to believe that they could provide informed education to their clients. This finding supports previous international research which indicates that RNs who have poor pharmacology knowledge are unable to monitor clients for side-effects or provide effective client education (Jordon *et al.* 1999). In rural and remote Australia, like other similar countries

where there are few other health professionals (Ross 1999, Rennie *et al.* 2000, Bushy 2002), it is the nurse who administers and supplies the medication to the client. Therefore, in these environments, a high level of pharmacology knowledge is needed to ensure client and nurse safety.

### The provision of education on medications prior to discharge (including CMI)

The CMI sheets are provided by pharmaceutical companies with the aim of supporting information exchange between the health professional supplying or dispensing the medication and the client (Communication Research Institute of Australia 2001). Despite the fact that Queensland Health Environmental Health Unit (2002) states that it is a responsibility of nurses to provide CMI (when available), only 22% of the RNs in this study stated they 'always' provided this information. This finding is similar to a study undertaken in Canada that found only 30% of clients reported receiving written information about their medications (Alibhai *et al.* 1999). Further, of these 30%, only 11% were given instructions about potential side-effects of their medication (Alibhai *et al.* 1999).

Reflecting the nature of remote area nursing work, where remote area RNs would be the pharmacist in the town, and therefore supply medications, the remote area RNs in this study were more likely to supply CMI to their clients. An important finding of this study was that there was no statistically significant difference in the supply of CMI to clients between RINs and non-RINs. These findings suggest that the importance of CMI provision has not been a major focus of the endorsement education programme.

In contrast to the findings on the provision of CMI, there was strong evidence of a difference between RINs and non-RINs in this study, with RINs more likely to provide client medication education prior to discharge. However, the findings indicated that client medication education is poorly carried out, with approximately 65% of the respondents failing to 'always' provide medication education on discharge. These findings are consistent with previous Queensland studies, which indicated low levels of client medication education prior to discharge (Henderson & Phillips 1996, Henderson & Zernike 2001). They are also consistent with international studies (Alibhai *et al.* 1999).

A reason for the poor discharge medication education could be related to the workload of nurses in Queensland which has previously been shown to be high and increasing (Hegney *et al.* 2003). Other studies have noted that high workload can contribute to decreased levels of therapeutic listening as well as the ability of the nurse to allocate time to

effective discharge education (Charles *et al.* 1999, Chant *et al.* 2002).

### Do nurses ensure the clients, who are disadvantaged due to their lack of understanding of English, receive education that overcomes the barrier?

There is little information developed in Australia, which provides consumer information to people who do not speak English as a first Language. Reflecting the reliance on communication in English, approximately 60% of the respondents in this study did not see the need to use either IHWs or interpreters to ensure that their clients fully understood the medication supplied to them. This lack of understanding by clients with regard to their medications would not only increase non-compliance, but also medication error (O'Shea 1999).

### Conclusion

The results of this study suggest that rural and remote area RNs in Queensland, have similar practices to nurses in other developed countries such as Canada (Alibhai *et al.* 1999). That is, whilst believing they have sufficient knowledge of pharmacology to provide client education, they do not always provide this education – especially to clients on discharge. Further, it is apparent that there is poor use of IHW and interpreters for people who do not have English as a first language.

The results of this study indicate that despite the fact that Queensland has begun to improve the level of pharmacology knowledge of practicing rural and remote area nurses through an endorsement programme, health facilities that wish to increase medication compliance and decrease re-presentations due to a lack of client understanding of the medication, must ensure that RNs provide adequate medication education. This includes adequate time in a working shift to be able to carry out this activity.

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### Contributions

Study design: DH, AP, JW; data analysis: DH, AP, JW, LR, CM; manuscript preparation: DH, AP, JW, LR, CM.

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