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# Changing GPs' attitudes to research

## Do N of 1 trials hold the key?

■ **Australia is investing in the Primary Health Care Research, Evaluation and Development (PHCRED) strategy to redress a lack of quality primary care research.<sup>1-4</sup> This study examines whether direct experience with data that are valuable in managing every day clinical decisions would overcome the interplay of factors that reduce general practitioner participation in research.<sup>5</sup>**

N of 1 trials expose clinicians to empirical data.<sup>6</sup> They are randomised, within patient, double blinded, multiple crossover trials in which the patient acts as their own control to assess their respective responses to a treatment or placebo (or another treatment). That is, treatments are randomised within paired treatment periods and applied to a patient in a blinded manner.

The patient's disease status is measured at set intervals corresponding to different treatment periods. After several crossover periods, outcomes obtained during the periods for the two drugs are compared using statistical analysis.

N of 1 trials can be used for patients with chronic stable conditions where individual responses to medication are variable, and where treatment decisions are frequently informed by informal 'trials of therapy' such as: 'try this medication, see how you go, and we'll review it in a few weeks' – an approach whose lack of rigour may result in poor decisions.<sup>6</sup>

In 1998, the University of Queensland Centre for General Practice established an N of 1 trial service for osteoarthritis, attention deficit hyperactivity disorder, menopausal symptoms and insomnia.<sup>6</sup> The authors hypothesised that involvement in N of 1 trials would acquaint the clinician with relevant research that is of direct benefit to the clinical care of individual patients and therefore would positively impact on research attitudes.

Previous N of 1 studies have focused on clinical outcomes or patient perspectives. The authors measured the impact of involvement in the N of 1 trials on GPs' attitudes to research. Specifically, we assessed whether GPs referring patients for N of 1 trials were representative of the GP population, whether GPs' attitudes to research changed with involvement in N of 1 trials, and whether their involvement in N of 1 trials resulted in evidence based changes to clinical practice.

### Methods

All 69 GPs who had referred patients to the N of 1 trial service by December 2000 were invited to participate. The study employed a mixed method design involving repeated postal questionnaires and semistructured interviews. A previously developed questionnaire<sup>7</sup> was extended for this study. The questionnaire assessed GPs':

- involvement in research
- attitudes toward research
- access to and use of electronic information sources
- use of evidence to inform clinical practice.

Basic demographics were also collected. The questionnaire and consent form were mailed to eligible GPs in December 2000. Reminder mailings of material were sent to nonresponders in February 2001. The survey was repeated in February 2002. Nonresponders were followed up in March 2002.

Nonparametric statistical methods were used to compare the GPs with a previously reported representative sample of 467 GPs within southeast Queensland.<sup>7</sup> Systematic changes in GPs' research attitudes and behaviour between the two questionnaires was tested using McNemar's test. Statistical significance for all tests was set at  $\alpha = 0.05$ .

General practitioners were interviewed by the principal author either face-to-face or, where necessary, by telephone. Interviews took approximately 15 minutes, were audiotaped, transcribed and entered

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into NUD\*IST4 qualitative research software. Recurrent patterns and themes were identified and classified. A subset of interviews were independently coded and analysed to assure validity of data interpretation.

## Ethics approval

The study was approved by the University of Queensland's Behavioural and Social Science Ethical Research Committee.

## Results

Twenty GPs (29%) completed both questionnaires; 18 of these respondents also participated in the semistructured interviews. No apparent differences in age, gender, medical school attended, time since graduation and known access to electronic information sources were observed between study GPs and those of southeast Queensland (*Table 1*). However, the study GPs reported higher rates of attendance at research methods courses ( $p=0.04$ ) and patient recruitment into research projects ( $p=0.004$ ).<sup>7</sup>

General practitioners generally reported positive attitudes to general practice research, and agreed that research evidence was important to clinical practice and that practising evidence based medicine improves patient care. However, few GPs reported any current involvement in research (*Table 2*), and most preferred their

Table 1. Demographic characteristics, baseline research involvement and access to electronic information sources (n=20) compared with the Southeast Queensland GP population (n=467)

	Questionnaire respondents	Southeast Queensland GP population	p value <sup>a</sup>
Age median years (range)	44.5 (29–72)	44.0 (26–79) <sup>b</sup>	0.5
Gender N (%)			
Male	14 (70)	295 (63) <sup>c</sup>	0.6
Role in practice N (%)			
Partner	5 (25)	–	
Employee or associate	8 (40)	–	
Solo GP	6 (30)	–	
Other	1 (5)	–	
Time spent in practice N (%)			
Full time (≥ eight sessions per week)	16 (80)	–	
Research in GP's job description N (%)			
Yes	1 (5)	–	
Memberships N (%)			
Division of general practice	19 (95)	–	
RACGP member, Fellow or associate	13 (65)	–	
Medical school N (%)			0.8
University of Queensland	15 (75)	302 (65)	
Other Australian university	1 (5)	43 (9)	
Overseas university	4 (20)	119 (26)	
Years since graduation median (range)	22.0 (5–45)	20.0 (3–56) <sup>d</sup>	0.4
Involvement in research N (%)			
Attended research methods course	10 (50)	128 (28) <sup>e</sup>	0.04
Recruited patients for research project	18 (90)	272 (59) <sup>e</sup>	0.004
Been principal investigator of a research project	6 (32) <sup>f</sup>	71 (15) <sup>g</sup>	0.1
Access to electronic information sources N (%)			
Medline	13 (68) <sup>f</sup>	223 (48) <sup>h</sup>	0.1
Cochrane Library	11 (58) <sup>f</sup>	204 (44) <sup>g</sup>	0.2
Internet	18 (95) <sup>f</sup>	416 (89) <sup>f</sup>	0.7

a = p value derived by comparing two groups using Fisher's exact test for categorical variables and Wilcoxon's rank-sum test for continuous variables  
b = missing data for eight GPs, c = missing data for two GPs, d = missing data for 10 GPs, e = missing data for four GPs, f = missing data for one GP,  
g = missing data for three GPs, h = missing data for five GPs

clinical experience to research evidence when making clinical decisions (Table 3). Although there were no significant differences in responses to either of these questions between questionnaires, there was a small increase in the number of GPs reporting a preference for research evidence at follow up.

The percentage of GPs who reported that more than 50% of their current clinical practice was evidence based did not significantly increase between questionnaires (40 and 42% respectively), nor did reported access to the internet, Medline or the Cochrane Library. However, the preference for evidence based information sources significantly increased for nine GPs (and did not change for five, and decreased for one GP) ( $p=0.02$ ). Significantly more GPs reported conducting a literature search or having a literature search conducted on their behalf using Medline or another bibliographic database (75% in the second questionnaire compared with 45% in the first,  $p=0.03$ ).

In interviews, most GPs considered N of 1 trials to be a clinical management tool because results were specific to individual patients rather than 'research'. Of those GPs who did consider N of 1 trials to be research, perceptions and attitudes varied markedly, from 'definitely research' (because they were a clinical application of research methods to determine individual patient's medications, and because the results of the N of 1 trials could be generalised to other patients) to 'poor quality research' (because they were not perceived to be randomised, double blind, controlled trials).

General practitioner acceptance of the empirical N of 1 trial results appeared to be influenced by the strength of their prior beliefs about the drugs being tested. For example, those who regularly used

paracetamol for osteoarthritis were unsurprised when the N of 1 trial demonstrated the patient gained no added benefit from nonsteroidal anti-inflammatory drugs (NSAIDs) than from paracetamol, and their confidence in prescribing paracetamol increased. However, a GP who managed osteoarthritis with regular NSAIDs was dismissive of her patient's N of 1 trial result when it found adequate symptom relief from paracetamol alone and was unlikely to change her subsequent practice.

## Discussion

N of 1 trials engage directly with clinical outcomes data to inform medical decisions for individual patients, yet GPs participating in these trials hardly changed their research attitudes, their perceived level of involvement in research, or the proportion of their clinical practice based on evidence. They did not consider N of 1 trials to be research or believe they were participating in research even while completing a questionnaire for this study.

While these findings are based on data collected between 2000 and 2002, there is no reason to suggest that there have been fundamental shifts in GP attitudes or perceptions since. Recognition of N of 1 trials as research would require GPs to cross a conceptual boundary in their understanding of research by acknowledging research as a process of systematic enquiry, rather than within more narrow definitions of finding generalisable 'truths'.<sup>7</sup>

General practitioners in this study were prepared to disregard the empirical data provided by the N of 1 trial in preference to their prior belief about appropriate medication, and preferred clinical experience to research evidence when making decisions for individual

Table 2. GPs' self reported perception of their participation in research at baseline (n=20) and at 12 month follow up (n=20)

	Never N (%)	In the past only N (%)	Currently only N (%)	Both in the past and currently N (%)
<b>Attended research methods course</b>				
Baseline*	9 (47)	9 (47)	0 (0)	1 (5)
12 month follow up	10 (50)	10 (50)	0 (0)	0 (0)
<b>Completed questionnaires for a research project</b>				
Baseline	2 (10)	14 (70)	2 (10)	2 (10)
12 month follow up	2 (10)	15 (75)	1 (5)	2 (10)
<b>Recruited patients for a research project</b>				
Baseline	2 (10)	11 (55)	3 (15)	4 (20)
12 month follow up	4 (20)	15 (75)	0 (0)	1 (5)
<b>Acted as principal investigator</b>				
Baseline*	13 (68)	4 (21)	1 (5)	1 (5)
12 month follow up	14 (70)	6 (30)	0 (0)	0 (0)
<b>Been coinvestigator on a research project</b>				
Baseline	10 (50)	8 (40)	1 (5)	1 (5)
12 month follow up*	11 (58)	8 (42)	0 (0)	0 (0)
<b>Published research results</b>				
Baseline	17 (85)	3 (15)	0 (0)	0 (0)
12 month follow up	16 (80)	4 (20)	0 (0)	0 (0)

\* Missing data for one GP

Table 3. GPs' attitudes to research at baseline (n=20) and 12 month follow up (n=20)

	N (%)	N (%)	N (%)	N (%)	N (%)
The usefulness of research in day-to-day management of patients	Extremely useful	Useful	Neither useful nor useless	Useless	Totally useless
Baseline	7 (35)	9 (45)	4 (20)	0 (0)	0 (0)
Follow up	1 (5)	18 (90)	0 (0)	0 (0)	1 (5)
Attitude toward the increasing profile of evidence based medicine	Extremely welcoming	Welcoming	Neither welcoming nor unwelcoming	Unwelcoming	Extremely unwelcoming
Baseline	6 (30)	11 (55)	3 (15)	0 (0)	0 (0)
Follow up	5 (25)	12 (60)	3 (15)	0 (0)	0 (0)
Research is important in general practice	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Baseline	11 (55)	8 (40)	1 (5)	0 (0)	0 (0)
Follow up	9 (45)	8 (40)	3 (15)	0 (0)	0 (0)
Practising evidence based medicine improves patient care	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Baseline	8 (40)	7 (35)	4 (20)	1 (5)	0 (0)
Follow up*	5 (26)	10 (53)	4 (21)	0 (0)	0 (0)
Prefer clinical experience to research evidence	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Baseline	0 (0)	7 (35)	9 (45)	3 (15)	1 (5)
Follow up	1 (5)	6 (30)	6 (30)	6 (30)	1 (5)
Desire more involvement in general practice research	Strongly agree	Agree	Neither agree nor disagree	Disagree	Strongly disagree
Baseline	3 (15)	4 (20)	10 (50)	3 (15)	0 (0)
Follow up*	2 (11)	7 (37)	5 (26)	5 (26)	0 (0)
* Missing data for one GP					

patients. People (clinicians included) tend to formulate an answer based on the initial belief (anchoring) and subsequently modify this based on selectively chosen new information that tends to confirm the initial belief (adjustment); fundamental changes are made reluctantly when prior belief is strong.<sup>8,9</sup> Changes to GPs' prescribing behaviours often requires multiple influences and is reinforced and sustained by patient experiences.<sup>10</sup>

While the study has strengths – including the representative demographic sample, and the mixture of both quantitative and qualitative methods for data collection – it also has some important weaknesses, including the prior research proclivity of the participating GPs, the small sample size, the lack of a control in the study design and reliance upon self reported data, which potentially limit the validity and generalisability of the findings. Nevertheless, they provide some useful insights to inform the debate about development of a research culture in general practice.

Increasing primary care research is not facilitated by simple acquaintance with clinical outcome data closely coupled to direct patient care. Developing a research culture in general practice remains an elusive goal, and is unlikely to be achieved using methodological innovations alone.

Conflict of interest: none declared.

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