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Qualitative Research

# Barriers and outcomes of an evidence-based approach to diagnosis and management of chronic obstructive pulmonary disease (COPD) in Australia: a qualitative study

Sarah Dennis<sup>a,b,\*</sup>, Helen K Reddel<sup>c</sup>, Sandy Middleton<sup>d,e</sup>, Iqbal Hasan<sup>b</sup>, Oshana Hermiz<sup>b</sup>, Rosemary Phillips<sup>d,e</sup>, Alan J Crockett<sup>f</sup>, Sanjyot Vagholkar<sup>g</sup>, Guy B Marks<sup>c,h</sup> and Nicholas Zwar<sup>g</sup>

<sup>a</sup>Faculty of Health Sciences, University of Sydney, Sydney, New South Wales, Australia, <sup>b</sup>Center for Primary Health Care and Equity, University of New South Wales, Sydney, New South Wales, Australia, <sup>c</sup>Woolcock Institute of Medical Research, University of Sydney, Sydney, New South Wales, Australia, <sup>d</sup>Nursing Research Institute, St Vincent's Health Australia, Sydney, New South Wales, Australia, <sup>e</sup>Australian Catholic University, Sydney, New South Wales, Australia, <sup>f</sup>School of Health Sciences, University of South Australia, Adelaide, South Australia, Australia, <sup>g</sup>School of Public Health and Community Medicine, University of New South Wales, Sydney, New South Wales, Australia and <sup>h</sup>South Western Sydney Clinical School, University of New South Wales, Sydney, New South Wales, Australia.

\*Correspondence to Sarah Dennis, Faculty of Health Sciences, The University of Sydney, 75 East Street, Lidcombe, New South Wales 2141, Australia; E-mail: [sarah.dennis@sydney.edu.au](mailto:sarah.dennis@sydney.edu.au)

## Abstract

**Background.** Chronic obstructive pulmonary disease (COPD) is commonly managed in primary care but there is poor awareness of evidence-based guidelines and the quality and interpretation of spirometry is suboptimal.

**Objectives.** The aims of this qualitative study were to explore how an intervention involving case finding and management of COPD was implemented, and the extent to which the GPs and practice nurses (PNs) worked in partnership to diagnose and manage COPD.

**Methods.** Semi-structured interviews with PNs ( $n = 7$ ), GPs ( $n = 4$ ) and patients ( $n = 26$ ) who had participated in the Primary care EarLy Intervention for Copd mANagement (PELICAN) study. The Theoretical Domains Framework was used to guide the coding and analysis of the interviews with PN and GPs. The patient interviews were analysed thematically.

**Results.** PNs developed technical skills and understood the requirements for good-quality spirometry. However, many lacked confidence in its interpretation and felt this was not part of their professional role. This was reflected in responses from the GPs. Once COPD was diagnosed, the GPs tended to manage the patients with the PNs less involved. This was in contrast with PNs' active role in managing patients with other chronic diseases such as diabetes. The extent to which the GPs and PNs worked in partnership to manage COPD varied.

**Conclusions.** PNs improved their skills and confidence in performing spirometry. Beliefs about their professional role, identity and confidence influenced the extent to which PNs were involved in interpretation of the spirometry results and managing the patient in partnership with the GP.

**Key words:** Chronic obstructive pulmonary disease, patient care team, primary health care.

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## Introduction

Chronic obstructive pulmonary disease (COPD) is the fifth leading cause of death for males and the sixth for females in Australia (1). The diagnosis is based on spirometry, and the prevalence of COPD in Australia was estimated from the Burden of Obstructive Lung Disease (BOLD) to be 10.8% aged 40 years or older (2). However, the prevalence of doctor-diagnosed COPD was only 5.9%, with poor correlation between doctor-diagnosed and spirometrically confirmed COPD (3).

The diagnosis and management of COPD in Australian primary care is suboptimal and indicates low levels of awareness (4) of the current COPD-X guidelines (5). Uptake and use of spirometry has been low in spite of (modest) rebates payable by the national health insurer (6). A qualitative study to determine the barriers and facilitators to the implementation of COPD guidelines in Australian general practice reported that the GPs were confident with aspects of management such as smoking cessation, flu vaccination and medications, but were less certain of their role in referral to pulmonary rehabilitation and oxygen therapy (7).

Implementation science is an emerging area of research and essential for evaluating the effectiveness of complex interventions (8,9). Reporting of barriers and facilitators to implementation is encouraged (10), and adding qualitative research to an implementation study provides rich feedback from study participants about their experience (11). The Theoretical Domains Framework (TDF) has been proposed as a tool to understand behaviour change among clinicians (12) and has been used in the primary care setting (13,14). The 14 domains describe factors that influence clinician behaviour such as knowledge, skills, professional role or identity and beliefs about capabilities, consequences and can be used to understand why evidence is not being incorporated into routine clinical practice.

The Primary care EarLy Intervention for Copd mANagement (PELICAN) cluster randomized trial trained practice nurses (PNs) in COPD case finding and compared GP-PN collaborative care with usual care in patients with newly diagnosed COPD (15). The aims of this qualitative study were to explore how the case finding and management of COPD were implemented during the PELICAN trial, and to identify the extent to which the participating GPs and PNs worked in partnership. Interviews conducted with patients provided their perspective on their experience of the PN involvement in diagnosis and management.

## Methods

The qualitative study was conducted following completion of the PELICAN trial. The detailed methods have been published (15); in brief, all participating PNs were trained in quality performance and interpretation of spirometry for case finding of COPD in smokers or ex-smokers aged >40 years. A pulmonary physiologist provided feedback on spirometry traces. Intervention group PNs only received education on evidence-based management for newly diagnosed COPD. GPs and PNs were trained in strategies for working in partnership for COPD management. Semi-structured telephone interviews (see online Supplementary Data Table 1) were conducted with a purposive sample of GPs and PNs. GPs and PNs from the intervention group who participated in the interview upon completion of the trial. Because several PNs had subsequently left the practice, a small number of control group PNs were approached.

A random sample of 50/112 patients who had completed the 12-month data collection in the intervention practices, stratified by age, gender and baseline smoking status, was invited by mail to

take part in a telephone interview (see online Supplementary Data Table 2). One reminder was sent to non-responding patients after 2 weeks.

One researcher (SD) interviewed the health professionals, and one of two researchers (OH, IH) interviewed the patients. All interviews were digitally recorded and transcribed verbatim. The transcripts were analysed thematically after coding using QSR NVivo (v10.0). The health professional interviews were coded by one researcher (SD) using the TDF (12), see Table 1. A second researcher (RP), blind to the initial coding, recoded the transcripts and the coding was compared. The patient interviews were coded and analysed thematically by two researchers (IH, SD). The TDF was not used to code the patient transcripts because their interviews had focused only on their experience and their perception of the GP-PN partnership in the management of their COPD.

## Results

Seven PNs and six GPs were approached to take part in the qualitative interviews; two GPs did not reply after follow-up. Interviews were conducted with four GPs and seven PNs from a total of seven practices enrolled in the PELICAN trial (Table 2). Two of the PNs were from control group practices. Of the 50 patients selected for interview, 26 patients consented; 42% (11/26) were female.

The results of the PN and GP interviews are described under the headings of the TDF (12). The interviews coded to 13 of the 14 domains; most comments were coded to beliefs about capabilities, environmental context, knowledge, skill and professional role. Nothing was coded to the domain of memory. The patient interviews provided further information from the patients' perspective about the extent to which they perceived the GPs and PNs working in partnership.

### Knowledge, skills and capabilities

These were considered together because there are synergies across the three domains and all were facilitators for implementation. All PNs valued the training and felt that they had improved their technical and interpretative spirometry skills.

I was more specific about obtaining spirometry results so if I didn't feel that they were good enough I would keep going until I got good one and I never really realized that before. (PN4, Practice 4, Intervention).

The GPs valued the improved PN skills.

It was good that [PN] attended the training program...and that just reinforced or just corrected any techniques that she might do with the spirometry. Most PNs felt they had increased their understanding of what spirometry results meant which enabled them to better explain the results to patients. (GP4, Practice 7, Intervention)

spirometry is quite easy to perform or explain but actually understanding what the results meant [...]. You have a basic understanding but it is better to improve that knowledge. You can provide the patients with more information and I think they really appreciate that. (PN3, Practice 3, Intervention)

The patients recognized this.

And she explained to me [...], what the printout meant, and what my results were in relation to what it should be. (Male 71 y, Practice 1)

However, not all PNs felt that they had improved their spirometry and interpretation skills.

Very basic. I had no idea before I started and really I still don't really even now. (PN6, Practice 6, Control)

**Table 1.** The domains and constructs of the Theoretical Domains Framework as described by Cane *et al.* (14)

Domain	Constructs	
Knowledge	Knowledge	
	Procedural knowledge	
Skills	Knowledge of task environment	
	Skills	
	Skills development	
	Competence	
	Ability	
	Interpersonal skills	
	Practice	
Social/professional role or identity	Skill assessment	
	Professional role	
	Professional identity	
	Social identity	
	Professional boundaries	
	Professional confidence	
	Group identity	
	Leadership	
	Organizational commitment	
	Self-confidence	
Beliefs about capabilities	Perceived competence	
	Self-efficacy	
	Perceived behavioural control	
	Beliefs	
	Self-esteem	
	Empowerment	
	Professional confidence	
Optimism	Optimism	
	Pessimism	
	Unrealistic expectancies	
	Anticipated regret	
	Consequents	
Reinforcement	Rewards	
	Incentives	
	Punishment	
	Consequents	
	Reinforcement	
	Contingencies	
	Sanctions	
	Intentions	Stability of intentions
		Stages of change model
		Transtheoretical model and stages of change
Goals	Goals (distal/proximal)	
	Goal priority	
	Goal/target setting	
	Goals (autonomous/controlled)	
	Action planning	
Memory, attention and decision processes	Implementation intention	
	Memory	
	Attention	
	Attention control	
Environmental context and resources	Decision making	
	Cognitive overload/tiredness	
	Environmental stressors	
	Resources/material resources	
	Organizational culture/climate	
	Salient events/critical incidents	
Social influences	Person × environment interaction	
	Barriers and facilitators	
	Social pressure	
	Social norms	
	Group conformity	

**Table 1. Continued**

Domain	Constructs
Emotion	Social comparisons
	Group norms
	Social support
	Power
	Intergroup conflict
	Alienation
	Group identity
	Modelling
	Fear
	Anxiety
Behavioural regulation	Affect
	Stress
	Depression
	Positive/negative affect
	Burn-out
Behavioural regulation	Self-monitoring
	Breaking habit
	Action planning

**Table 2.** Characteristics of general practitioners and practice nurses interviewed

Participant characteristics	General practitioners, <i>n</i> = 4	Practice nurses, <i>n</i> = 7
Female, <i>n</i> (%)	1 (25%)	7 (100%)
Australian trained, <i>n</i> (%)	4 (100%)	5 (71.4%)
Years since graduation, mean (SD)	28.9 (7.4)	29.6 (12.9)
Practice ≤3 GP, <i>n</i> (%)	4 (100%)	6 (86%)
Metropolitan practices, <i>n</i> (%)	1 (25%)	2 (28.6%)
Practice with spirometer prior to study, <i>n</i> (%)	3 (75%)	7 (100%)
Previous COPD training, <i>n</i> (%)	1 (25%)	2 (28.6%)

The GPs felt that because of the PNs new skills the practice was better at identifying and managing patients with COPD.

We are probably better at diagnosing them [...] with more appreciation of the diagnosis we have probably more appreciation of the treatment and particularly the smoking cessation I think which is an important part and the nurses role in it was really good. (GP3, Practice 4, Intervention)

PNs felt empowered and confident with their increased skills and knowledge. This was reflected in the way they spoke about their abilities and the way they used their knowledge in discussions with patients.

I can actually show the patients and say look you can see the curve. It is not on top of the other it is not at all reliable look we are going to have to do a few more blows and they're usually quite compliant and that helps a little bit as well. [...] It has been very confidence building. (PN2, Practice 2, Control)

Some PNs used the spirometry in discussions with the GP to facilitate teamwork and as a joint learning opportunity.

I would point out the measures that I was looking at and where the FEV/FVC ratio and looking at the FEV<sub>1</sub> value and the perceived changes and whether there was an increase after the administration of the Ventolin. I would explain that when I was talking to the doctors. So basically it was partly me reminding them particular things that we were looking at in the spirometry because they are not looking at it every day either. (PN2, Practice 2, Control)

Some patients felt that the PN was very capable in their interpretation and were aware of the teamwork between the PN and GP. They appreciated the different roles of the GP and PN.

basically she gave him [GP] the results [...] and then he went over it with me again. She'd gone over it with me, and then he went over it again and explained exactly what she'd done and was looking for. So although he wasn't there for the actual testing, he got a very full report. (Male 75 y, Practice 8)

Some GPs felt that the PNs did not want to make decisions about the diagnosis.

neither [PNs] were particularly inclined to make their own interpretations. So what they did was to do the spirometry which they did well [...] and then once the results were there the doctor was able to make comment and seen where things could have gone from there. (GP1, Practice 3, Intervention)

While some PNs may not have been confident making the diagnosis, they demonstrated their capabilities by using spirometry results to initiate a smoking cessation discussion.

...look it is a good thing you stopped smoking when you did. We had detected a bit of a problem that it would be much worse if you had kept smoking. (PN2, Practice 2, Control)

One PN was so capable and confident using spirometry that she took on the responsibility for training the new GP registrars.

### Professional role and identity

These comments relate to professional roles, boundaries and leadership within the practice. There appeared to be different PN roles and levels of GP-PN teamwork between practices. One PN talked about her role as 'assisting with the diagnosis' (PN2, Practice 2, Control).

One GP clearly considered diagnosis to be part of the PN's role.

I would imagine that she would have given some interpretation into it. They are fairly proactive our nurses so I think they would have been told that they were normal or would have been worried and wanted the doctor to review that sort of thing. (GP2, Practice 5, Intervention)

In the practice below, neither diagnosis nor management was part of the PN role but there was some partnership.

Well what would happen is that she would do the spirometry then come to me for the interpretation and at that point in time we usually sat with the patient and told them what it meant and what it meant in the majority of cases it was that they hadn't any significant lung damage but they should stop smoking. (GP1, Practice 3, Intervention)

These differences in roles were reflected in the patient comments.

She said that you've got that, and then the doctor will explain to you. (Female 68 y, Practice 1)

Once the diagnosis of COPD had been made, there was little evidence of teamwork to manage the condition and this seemed to be related to existing perceptions of professional roles and organizational culture within the practice.

And the diabetes we do it. The COPD for that one year we did it but since then we haven't done any. I mean we do the spiro[metry] and the diagnosis and give them to the doctor and that's it. (PN7, Practice 4, Intervention)

The GPs generally saw their role as providing COPD management. While in some practices this resembled teamwork, in others there was limited discussion between the GP and PN.

Generally the patient would come back in and see us to discuss and talk about management and then sometimes if it was to do with smoking cessation they'd go back to the nurse. (GP3, Practice 4, Intervention)

This teamwork was reflected in the patient's description of the way the GP and PN worked.

Well, it seemed a very easy relationship they had in dealing with me the patient and they both seemed to be totally relaxed in the way that they talked about my problem, so they seemed to me to be a good working team. (Male 66 y, Practice 4)

### Optimism

Several comments were related to optimism where the PN discussed the benefits to the practice of her improved skills. Pessimism was discussed in the context of barriers and the likelihood that patients would return for follow-up and tests.

### Beliefs about consequences

In one practice both the GP and PN reflected on the changes they had made in response to the study. This practice already had a special interest in respiratory illness, and they were surprised at how much they were able to improve the care they were providing for their patients.

Yes and it has certainly be interesting I think because one of the preconceptions that I took into the study was that we were going to find a much higher incidence of people with lung disease than in actual fact turned out. (GP1, Practice 3, Intervention)

We have quite a lot of patients with COPD so I think it kind of helped our practice. Our management of patients improved and we [...] had people coming back to review their treatment and how they were going where previously things might have gone unnoticed or unmonitored. (PN3, Practice 3, Intervention)

### Reinforcement

The PNs valued the feedback from the pulmonary physiologist on their spirometry technique and they were able to use this to improve their skills. They were also positive about their experience working with patients to address health issues such as smoking.

### Environmental context and resources

As expected, time was a barrier to use of spirometry

It takes at least about half an hour because you've got to do the pre [spirometry]. First of all they want to know what the study is about. [...] then you have to explain what COPD is, then you have to go through how you want them to do the spirometry and you go through the spirometry, then you get them to have a 10 minute wait by the time you work it out [...] and by the time you get to the end of it you [are] ticking on for 45 minutes. (PN5, Practice 5, Intervention)

While time was an issue, having the spirometry in-house was a facilitator.

We are more likely to order the tests when they can be performed by the practice nurse and I think that the patients are more likely to come back and comply with them if they are being performed in house rather than outsourced. (GP2, Practice 5, Intervention)

There was a high turnover of PNs in the study (~25%), which meant that practices lost the increased skills of the trained PN.

It was good that the nurses got up skilled and the only thing is that as time goes on the nurses change we don't necessarily always have nurses with the same skill set. (GP3, Practice 4, Intervention)

### Social influences/organizational culture

Contrasting views were expressed by two PNs about the social norms and organizational culture that existed in their practices that influenced the way they worked with their GPs.

No, we never get together with doctors [...] to discuss anything like that. (PN4, Practice 4, Intervention)  
That is just typical of how I work with the GP. We work as a team and we take the team approach. (PN5, Practice 5, Intervention).

### Behavioural regulation

Taking part in the study provided a catalyst for some practices to rethink the way that they organized care, moving from reactive to more proactive care.

Well I think for me it is being able to shift from a reactive to proactive team and having a structure in place that means that we can do stuff with patients that we could have always done before but it tended not to happen because it was a little more difficult. Having trained staff is probably the key to the whole thing I guess. (GP1, Practice 3, Intervention)

One PN described having more control over organizing her patient load in response to skills development.

Now that I am more confident in using the spirometry I sort of have more control over there when we do the asthma. (PN1, Practice 1, Intervention)

### Discussion

This study explored the extent to which an evidence-based intervention to improve the diagnosis and management of COPD through a GP–PN team management approach was implemented. Some practices were clearly implementing a teamwork approach to COPD diagnosis and management but others were not. The culture of the practice might have influenced this. GP–PN team working likely was already established in some practices prior to the trial.

Most of the PNs reported an increase in knowledge, skill and confidence, particularly around performance of spirometry. The GPs recognized and valued this. Some of the PNs and GPs described a teamwork approach to making the diagnosis of COPD but in other practices their roles seemed to be quite distinct. The patients' comments reflected this, with some describing situations where there had clearly been a discussion between the GP and PN, and others where this had not happened. Similarly, once COPD was diagnosed, GP–PN teamwork to manage the disease was not implemented consistently across practices and this finding was reinforced by the patient interviews.

The literature on multidisciplinary team working in primary care has explored the dynamics of team-working (16). One of the themes emerging from that research is the importance of trust in professional roles and competence in facilitating team-working (16). In our study, the PNs and GPs did not talk about trust in relation to their professional role, identity and competence although trust may have influenced why some of the PNs were not comfortable interpreting the spirometry. Other PNs described a professional relationship where there appeared to be mutual trust.

We found that beliefs around professional role and identity were key barriers to the implementation of the partnership intervention, and this may be related to the practice's pre-existing organizational culture. Few PNs reported having a role in diagnosis and care for COPD. This may reflect the nurses' perception that they do not have a role in making a diagnosis, but are happy to communicate it to

patients once the diagnosis has been made; it also reflects the variation in the roles and levels of training of PNs in Australia and the lack of understanding of their capabilities (17). Surveys of nurses working in general practice in Australia have identified lack of career structure as an issue and many of those surveyed had been in their current role for <4 years (18). PN turnover was a barrier to further implementation as it resulted in loss of capacity within the practice. The new education and career framework for PNs in Australia aims to address this by providing a clear framework for PN skills, post-graduate qualifications and roles (19).

A limitation of the study was the small sample size for the GP and PN interviews. The high PN attrition rate meant that some of the intervention nurses had left the practice by the time the interviews were scheduled (3–6 months after the final patient assessment). A strength was that the patient interviews provided further evidence of the extent to which the PN and GP worked in partnership when managing their COPD.

This study highlighted the usual time and inadequate reimbursement barriers to the use of spirometry in general practice (20). What this study does not tell us is whether the influence of beliefs about professional role, identity and competence has a similar influence on PN and GP working in partnership to manage other chronic conditions or whether these issues are unique to COPD.

### Conclusion

In this study, in which GPs and PNs were trained to implement a teamwork approach to diagnosis and management of COPD, PNs had improved their skills and confidence in spirometry. Beliefs about professional role, identity and confidence impacted on the extent to which the PN was involved in interpretation of the spirometry results and managing newly diagnosed patients in partnership with the GP. Further research is needed to explore how the diagnosis and management of COPD in primary care can be optimized to ensure patients are receiving evidence-based care.

### Supplementary material

Supplementary material is available at *Family Practice* online.

### Declaration

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