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Sonya Murray

Yvonne Kutzer  
*Edith Cowan University*

Emily Habgood

Peter Murchie

Fiona Walter

*See next page for additional authors*

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## Authors

Sonya Murray, Yvonne Kutzer, Emily Habgood, Peter Murchie, Fiona Walter, Danielle Mazza, Shaouli Shahid, and Jon D. Emery

## Qualitative Research

# Reducing barriers to consulting a General Practitioner in patients at increased risk of lung cancer: a qualitative evaluation of the CHEST Australia intervention

Sonya R Murray<sup>a</sup>, Yvonne Kutzer<sup>b</sup>, Emily Habgood<sup>c</sup>, Peter Murchie<sup>d</sup>,  
Fiona M Walter<sup>a,c,e</sup>, Danielle Mazza<sup>f</sup>, Shaouli Shahid<sup>g</sup> and  
Jon D Emery<sup>a,c,e,\*</sup>

<sup>a</sup>General Practice, School of Primary, Aboriginal and Rural Health Care, The University of Western Australia, Perth, Australia, <sup>b</sup>School of Nursing & Midwifery, Edith Cowan University, Perth, Australia, <sup>c</sup>Department of General Practice, The University of Melbourne, Melbourne, Australia, <sup>d</sup>The Centre of Academic Primary Care, The University of Aberdeen, UK, <sup>e</sup>The Primary Care Unit, Department of Public Health and Primary Care, University of Cambridge, Cambridge, UK, <sup>f</sup>Department of General Practice, Monash University, Melbourne, Australia and <sup>g</sup>Centre for Aboriginal Studies, Curtin University, Perth, Australia.

\*Correspondence to Jon D Emery, University of Melbourne, Level 10, Victorian Comprehensive Cancer Centre, 305 Grattan Street, Victoria 3010, Australia; E-mail: [jon.emery@unimelb.edu.au](mailto:jon.emery@unimelb.edu.au)

## Abstract

**Background.** Lung cancer has one of the lowest survival outcomes of any cancer because over two-thirds of patients are diagnosed when curative treatment is no longer possible, partly due to later presentation with symptoms to a healthcare provider.

**Objective.** To explore the theoretical underpinning of the Scottish CHEST intervention in participants randomized to the intervention group within the CHEST Australia trial.

**Methods.** A purposive maximum variation sample of participants who received the intervention in the CHEST trial in Perth, Western Australia ( $N = 13$ ) and Melbourne, Victoria, ( $N = 7$ ) were interviewed. Patients were asked about their experience of the CHEST consultation, their recall of the main messages, their symptom appraisal and issues relating to help seeking when they develop symptoms. Thematic analysis was conducted to draw common themes between the participants.

**Results.** We identified themes consistent with the theoretical basis of the CHEST intervention. Barriers to consultation identified in the CHEST Australia trial participants were smoker stigmatization, guilt, fatalism and symptom normalization. We identified a general perceived mistrust of GPs based on previous negative experiences of visiting their GP in relation to their smoking. The intervention tackled barriers around lecturing and feelings of guilt and stigma related to smoking. We identified expected effects on salience and personal relevance of symptoms. Participants reported a clearer understanding of what to look out for and when to take action after the CHEST intervention.

**Conclusions.** These findings suggest that the CHEST Australia intervention is achieving the desired objectives at the qualitative level through the proposed theoretical mechanisms.

**Key words:** Early consultation, intervention, lung cancer and consultation, primary health care, qualitative.

## Introduction

Lung cancer is the most common cancer worldwide (1). In Australia there were 10,926 new cases in 2012 and 8216 deaths in 2013 (2). In 2017, it is estimated that 12,434 new cases of lung cancer will be diagnosed in Australia (7094 males and 5340 females) (2). In 2013, lung cancer accounted for the highest number of cancer deaths in Australia and is estimated to remain the most common cause of death from cancer in 2017 (2). This reflects its relatively high incidence (55 per 100,000 for males and 33 per 100,000 for females in 2013) and its low relative survival, only 16% survive beyond 5 years (2).

There is extensive literature spanning several decades on the concept of 'diagnostic delay' in cancer (3,4). This recognizes that patient pathways to presentation to healthcare and initial management in primary care are important determinants of cancer patient outcomes. The Aarhus statement for improving design and reporting of research on early cancer diagnosis distinguishes between the appraisal interval or the time taken by the patient to interpret bodily changes and the help seeking interval which describes the time taken to consult a clinician (5). Long intervals between patient's detection of symptoms and presentation in primary care are documented in literature on lung cancer (6,7). This can come down to reasons such as normalizing symptoms or fear and lack of knowledge of cancer.

The CHEST Australia trial delivered an intervention to individuals at increased risk of lung cancer aimed at promoting earlier presentation to primary healthcare. The intervention was based on the CHEST trial in Scotland, the first to show preliminary evidence that this approach could alter consulting patterns with potentially serious respiratory symptoms in this population (8). In this trial, a theoretically based intervention was tested which comprised of a primary-care nurse consultation to discuss and implement a self-help manual, followed by self-monitoring reminders to improve symptom appraisal and encourage help seeking in patients at increased risk of lung cancer.

The key objectives of the CHEST intervention were to (i) increase the salience and personal relevance of symptoms, (ii) improve knowledge of symptoms by introducing chest disease and illness prototypes, (iii) reinforce the benefits of early intervention in lung cancer and other chest disease, (iv) tackle barriers to consultation, (v) promote self-efficacy by developing personalized action and coping plans and (vi) sanction early consultation (9).

While population level interventions do show promise in increasing cancer awareness (10), there has been limited research on interventions delivered to individuals at increased risk of lung cancer and promotion of help seeking behavior. The CHEST Australia trial is testing a locally adapted version of the CHEST intervention aimed at patients at increased risk of lung cancer (11). A small subset of participants from the trial were invited for an interview to explore the experiences of those randomized to receive the CHEST intervention. The aim of this qualitative substudy was to confirm the theoretical underpinning of the CHEST intervention and identify any barriers to early consultation.

## Methods

### Recruitment and sampling

For the CHEST Australia trial, smokers and ex-smokers were identified from general practice computerized records and invited to participate in the study by letter. Trial participants provided additional consent to be invited into the qualitative substudy by phone. Informed consent for the qualitative substudy was obtained prior

to the commencement of each interview. Informed consent ensured that each participant consented to audio recordings and a verbal reminder that participants could withdraw without providing a reason at any stage.

We chose to conduct face-to-face interviews rather than phone interviews to enable the researcher to observe body language and nonverbal cues. We also felt that the participants would feel more comfortable in their own home and be more open with their answers.

A purposive sampling strategy reflecting the larger study group's demographics was utilized to provide rich interview data and ensure representation (Table 1). Sampling for maximum variation was conducted according to age, gender, location and smoking status. Participants were recruited within a month of completing the 12-month exit questionnaire in the trial. Interviews were conducted until data saturation was reached around key themes.

### Data generation

Data collection was carried out by two researchers (SM and YK) between October 2015 and June 2016. Individual qualitative interviews were conducted using a semi-structured topic guide. The topic guide was used to initiate discussion and included questions on their experience of the CHEST consultation and self-help manual, their reasons for participation in the study, their recall of the main messages, their thoughts on prompts used in the trial, their symptom appraisal and issues relating to help seeking when they developed symptoms (Topic guide for participant interviews—Supplementary Material).

Interviews were audio-recorded and transcribed verbatim using Pacific Transcription Services ([www.pacifictranscription.com.au](http://www.pacifictranscription.com.au)).

### Data analysis

Thematic analysis initially involved thorough reading of each transcript to generate early codes. Coding was carried out independently by two members of the research team and discussed at project meetings. NVivo software version 10 (QSR International) was used to organize and code data. After all the data were initially coded, overarching themes were generated by combining different codes. Themes were then reviewed and refined and linkages between themes were established and used to develop an interpretative model presented in Figure 1. Key representative quotes from the data to support each theme were identified (Tables 2 and 3).

## Results

Twenty people participated in this study, 13 participants were recruited from Perth, Western Australia and seven from Melbourne, Victoria (representing the larger study group distribution). Eight participants were female, five were current smokers and ages ranged from 56 to 79 years (see Table 1). Interview length ranged between 16 and 65 minutes and the average duration was 35 minutes. Analysis resulted in a number of distinct themes. Quotations to support each overarching theme and subtheme are described in Table 2.

### Barriers to visiting the GP

When examining how the CHEST intervention had been received by participants, we identified many barriers to help seeking. Figure 1 describes the original CHEST intervention model and objectives and highlights differences from an Australian perspective. While fear and fatalism, symptom normalization, guilt and stigma were common barriers identified, in Australia making an appointment for a consultation was not a perceived barrier.

**Table 1.** Baseline characteristics of participants (*N* = 20) who participated in the CHEST Australia qualitative study.

Variable	Number (%)	M (SD)	Range
Gender			
Male	12 (60)		
Female	8 (40)		
Age		67 (7.14)	56–79
Western Australia	13 (65)		
Victoria	7 (35)		
Current smoking status			
Nonsmoker	14 (70)		
Current smoker	6 (30)		
Pack years (median) (SD)		36 (26.8)	20–113
Number of delays <sup>a</sup>			
0	9 (45)		
1	7 (35)		
2	2 (10)		
3	2 (10)		
Previous total 12-month consults		12 (8)	0–30
Low (< 10)	10 (50)		
Moderate (10–20)	6 (30)		
High (> 20)	4 (20)		
MRC dyspnea score <sup>b</sup>			
1 to 3	18 (90)		
4 to 5	2 (10)		
FEV1 predicted score <sup>c</sup> (median) (SD)		80.9 (23)	28–107
Employment status			
Employed	8 (40)		
Unemployed	7 (35)		
Retired	1 (5)		
Invalid (Unable to work)	4 (20)		
Education level			
< Year 11	9 (45)		
Year 12 or equivalent	4 (20)		
Undergraduate	2 (10)		
Postgraduate	2 (10)		
TAFE/vocational training	3 (15)		
Home ownership			
Yes	15 (75)		
No	5 (25)		
Living status			
Lives alone	9 (45)		
Lives with spouse	11 (55)		
Previous medical comorbidity			
COPD	2 (10)		
Emphysema	1 (5)		
Asthma	1 (5)		
Lung cancer <sup>d</sup>	1 (5)		
Cancer (other)	1 (5)		

COPD, chronic obstructive pulmonary disease; FEV, forced expiratory volume; MRC, medical research council; TAFE, technical and further education.

<sup>a</sup>A questionnaire that obtains data on presenting symptoms and the time interval from first noticing this symptom to presentation to a healthcare provider.

<sup>b</sup>Medical Research Council Dyspnea Scale for grading the degree of a patient's breathlessness related to activity, graded from 1–5.

<sup>c</sup>FEV1 is the volume of air that can forcibly be blown out in one second, after full inspiration using a spirometer to measure lung function.

<sup>d</sup>This patient was diagnosed with lung cancer while enrolled within the 12-month CHEST Australia trial.

### Fear and fatalism

Many had a fatalistic attitude toward lung cancer and this resulted in an underlying fear of diagnosis. Many expressed their fear of the

unknown or having to face a terminal disease and dealing with the consequences of this. It was viewed as easier to go into denial and not have to address these issues. Some participants felt they would leave visiting their GP to the last minute because of this fear (Table 2).

### Symptom normalization

Reasons for not visiting the GP were justified by innocuous explanations which seemed to be well considered. Many attributed their cough or other symptoms to 'old age' or 'what I normally have' (Table 2). Growing older was used to account for a number of symptoms such as coughing, wheeziness and shortness of breath. Those who were current smokers attributed their ongoing cough as being due to smoking, but because there was no obvious difference from what they normally had, they did not recognize this symptom as being important.

The phenomenon of cognitive dissonance was also observed in various ways and this contributed to a delay in consulting. Commonly there was a dissonance reported between attitudes and behavior such as responding to a stressful situation by smoking or rationalizing that because only a few cigarettes were smoked per day this limited their chance of getting lung cancer. Some even rationalized that they did not have a lung condition at all. Some patients validated their explanations by the experiences of family members such as explaining that because their parents had smoked for a long time and did not succumb to lung cancer, then the same would apply to them.

### Guilt and stigma

Many felt stigmatized and labeled as 'an outcast' in society and by their own families because of their smoking and this was reinforced when they visited the GP. A form of 'avoidance coping' was observed as many ex-smokers said if they were currently smoking they may not have been so inclined to participate in the study (Table 2).

### Previous experiences of visiting the GP

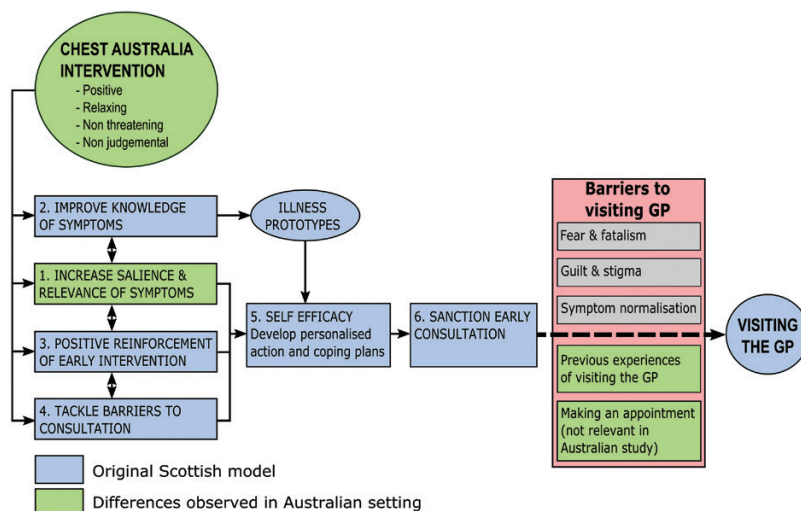
Past experiences of visiting the GP was identified as a key barrier to early help seeking. Many patients were put off by perceptions of lecturing or reprimanding to cease smoking by their GP and they felt this reinforced a feeling of guilt. How the GP delivered this message was seen as important in building trust (Table 2). An underlying perceived mistrust of the GP related to various reasons such as experiences of a perceived missed diagnosis and misdiagnosis contributed to consulting delay. Another concern expressed by some patients was the perception of miscommunication between the GP and patient. Some did not understand their current chest diagnosis and would find further information on the internet to clarify their condition (Table 2). Some expressed that their GP could not relate or understand their addiction or simply they were not being listened too (Table 2).

### Perceptions of the chest intervention

Feedback from the intervention demonstrated that the theoretically based objectives were potentially being achieved.

### Salience

There was evidence that the intervention altered salience or personal relevance of symptoms. Some patients expressed that the intervention brought symptoms to the forefront of their mind and they therefore addressed them more quickly. Some patients already had a broader self-awareness of their health, due to past or present exposure or current health issues or family history and this may have also



**Figure 1.** The original Scottish 'CHEST' model, with differences observed in the Australian setting, based on data from 20 patients at increased risk of lung cancer.

triggered their participation in the study. In Perth, those who had been exposed to the mining industry were particularly aware of their lung health. A family history of cancer also reinforced the need to be vigilant in some. Some who were chronically ill did not respond as well to the intervention and gave reasons such as; they already knew what to look out for, they were already frequently visiting their GP or it was 'too late' to be useful for them (Table 3).

### Increase in symptom awareness

Most people felt that a list of symptoms provided in the CHEST self-help manual led to a clearer understanding of what to look out for and when to take action. In some cases, patients reported that the intervention made them think about how long they had experienced a symptom for and whether the symptom was getting worse. It also made some more aware of which symptoms were of importance.

### Perceptions of the components of the intervention

#### Feedback from the self-help manual

Feedback from the self-help manual indicated that it helped increase some participants' knowledge of relevant symptoms. The CHEST self-help manual was described as useful, logical and a good 'reference guide' with valid information. In some cases, there was reassurance that the manual provided the 'correct' information. The benefits of early consultation were reinforced in the manual using stories and timelines of diagnosed lung cancer patients and some reported this was effective communication. Many liked the perceived control they had when referring to the manual that they could look at it on their terms (Table 3).

#### Feedback from the self-monitoring reminders

There was evidence that the prompts and reminders had an impact on sanctioning early consultation and that they added weight to an intention to act and promote self-efficacy or confidently make an appointment. Reminders or prompts (in the form of email, SMS or postcards) of wanted behavior were carried out monthly reminding participants to check their symptoms and visit the doctor if needed. Tailoring reminders to individual preferences was also important in promoting self-efficacy. Many preferred the positive messages,

images and reminders from the CHEST intervention such as the '123' logo and the fridge magnet (Table 3).

### Tackling barriers

There was evidence that the intervention tackled barriers around GP lecturing and feelings of guilt and stigma related to smoking. The intervention was viewed as 'relaxed' and delivered in a non-threatening environment where patients at increased risk of lung cancer could openly talk about their smoking and lung health. The intervention was felt not to judge patients or make them feel guilty for smoking or having previously smoked. Many reported that they preferred not to feel 'lectured at.' Some liked the 'extra level of care' such as having a spirometry test that was provided in the consultation (Table 3).

### Conclusions

This study explored the experiences of Australian patients at higher risk of lung cancer who received the CHEST intervention. From these qualitative findings it appears that the intervention is performing as predicted by its theoretical underpinning, with some novel findings in the Australian setting (see Figure 1).

The intervention was reported as delivered in a relaxed, non-threatening environment where patients at increased risk of lung cancer could openly talk about their smoking and lung health. The intervention did not make participants' feel judged or feel guilty for smoking or having previously smoked, it therefore enabled more open and honest discussion. After the intervention, participants reported a clearer understanding of what symptom changes to look out for and when to take action and they felt that the CHEST self-help manual was a valid and useful guide. The benefits of early consultation appeared to have been understood.

There was some initial evidence that the intervention altered salience or personal relevance of symptoms and this potentially led to changing attitudes regarding visiting the GP. Some already had a broader self-awareness of their health, due to past or present exposure or current health issues or family history. Interestingly, those who were chronically ill did not respond as well to the intervention perhaps because they already had salient symptoms and fewer barriers to help seeking.



**Table 2.** Summary of barriers to visiting the GP from 20 participants who participated in the CHEST Australia qualitative study**Fear and fatalism**

Lung cancer was viewed in a fatalistic way and this drove an underlying feeling of fear for some.

'You try to block it off. You try and think, no, it's not me. But then again, you're also, on the other side of it, every little pain or wheeze you feel you think, oh no, this might be it; this might be the cigarette that gives me lung cancer...' (7012, female, 59 years).

'Some people like to stick their head in the sand, particularly if you're a smoker and you know you're doing something that's damaging your health.' (1400, male, 60 years).

'Yeah. Because when you are a smoker, you're always hesitant about anything to do with the chest and the lungs, you know? Because when you smoke, you know it's bad and I mean I can only just say me, but I know a lot of people that smoke, they don't want to have a chest x-ray because they're scared, basically. Of cancer or yeah what they find. Yeah I can remember always thinking that, mmm.' (13007, female, 68 years).

**Symptom normalization**

Many attributed their symptoms to old age or 'what I normally have'.

'But is that just age or whatever? I believe it's just age. Or my body you know you can't do as many push ups as you used to do, you can't do as many sit ups, it's just natural.' (7017, male 71 years).

'But I mean he looked quite well. I mean he could walk and talk and [laughs] do normal things. He was physically active, he just always coughed, he was always like that.' (13001, male, 67 years).

Commonly, there was a dissonance between attitudes and behavior.

'I'm not really a heavy smoker. No I don't smoke many cigarettes at all. I smoke something else, but...I should be fine in the long term...' (14017, male 59 years).

One man described how he dealt with the stress of his father dying of a smoking-related illness.

'Yeah, and the stupidity of all of that is that I hadn't smoked for four years, and the night Dad passed away I started again.....but the stupidity of it was that the smoking by and by caused Dad's death.' (14016, male, 56 years).

Whereas others rationalized they did not have a lung condition.

'Well, I don't have chest symptoms, I have swallowing problems.' (3018, female, 63 years).

Some believed that because their parents lived a long time and smoked, that the same would apply to them. This idea of 'candidacy' or that another family member is a better candidate for getting cancer was repeatedly expressed.

'I still get a bit congested in the mornings, but that's about it. Like I said, I'm-under no illusions that anything could happen down the track. Well I mean my parents smoked and both my parents at the moment are fine...' (14017, male, 59 years).

'...My parents lived to 103 and 102 and they died of old age. It doesn't matter what I do, I'm invincible...' (4002, male, 71 years).

**Guilt and stigma**

Feelings of guilt and stigmatism were commonly reported.

'But I'm always being hassled as an evil person of society. I just feel as though we're a very much persecuted minority now. ...' (3013, male, 59 years).

'Because smokers are now like witches they used to burn at the stake...' (3018, male, 59 years).

'You feel kind of guilty I suppose. You know he's going to say are you still smoking or it's the same, have you lost weight? That type of thing. You think oh gosh, you almost feel like a juvenile that you're doing something wrong.' (8002, female, 70 years).

**Previous experiences of visiting the GP**

Past experiences of GP consultations was identified as a key barrier to early help seeking.

**Lecturing and reprimanding**

'...because I'm a smoker and I'm used to being just lectured. It's just when I got lectured all the time, I just stopped going to see them. I used to have past GPs - you go in there because you've got a crook knee, and they want to go, smoking's thing nyah!' (3013, male, 59 years).

'They'd given me another doctor. When I went and I sat down, and the lady said to me, do you smoke? I said, yes. I said, I smoke. I said, what are you shaking your finger at me for? So I don't like that.. I got up and I walked out.' (22029, male, 79 years).

**Perceived mistrust**

'So, I feel - although I feel confident going to see them, I don't know, I feel I just want to have another doctor's surgery to go to. Yeah, I just - I don't know what it is. I don't feel comfortable anymore going there'. (8002, female, 70 years old, missed bowel cancer diagnosis).

'Yeah, because I had a horror - my late wife was going to see her GP constantly about - and he kept saying, your asthma - upping the asthma medication - and giving her other things for asthma - and it ended up she actually had leukaemia.' (3013, male, 59 years).

**Perceived Miscommunication**

'Once I understood what emphysema was about because the doctor just said I had emphysema, he didn't say much about it. I googled it and I found out that it wasn't a death sentence that mesothelioma was -I was relieved.' (7017, male, 71 years,, did not understand diagnosis).

'No, it scared me knowing that, having been diagnosed with COPD at that time and that's when I got home and had a look on the internet and found out what it was and what the various prognoses were. Well I was relieved that I had a good reading on the spirometer test so that sort of eased it a fair bit but it still had me in anxiety for a couple of weeks wondering what was right and what was wrong on the internet.' (8001, male, 69 years,).

Each theme is discussed with supporting quotes.

There was also evidence that the prompts and reminders had an impact on early help seeking behavior. Participants responded particularly well to positive messages and images in the Australian CHEST intervention. Tailoring reminders to individual preferences was important in promoting self-efficacy.

Barriers to seeking help identified in the CHEST Australia trial included; smoker stigmatization, fatalism, symptom normalization and the worry that GPs had a negative attitude toward smokers and

that they were not taken seriously. An underlying perception of mistrust of the GP was also expressed in the Australian setting. This was due to reasons such as a perceived previous missed diagnosis or miscommunication. Previous experiences of visiting the GP which had focused on perceived reprimanding by the GP to quit smoking were commonly described as an important barrier to early consultation.

Similar barriers to consultation were also described in the original Scottish CHEST trial. Obtaining an appointment to visit a GP

**Table 3.** Summary of perceptions of the CHEST intervention from 20 participants who participated in the CHEST Australia trial**Saliency**

A sense of altering ones saliency (Objective 1) or personal relevance of symptoms was perceived.

'Yeah my wife said you better see someone about that cough, it has gone on too long, reading the booklet helped me see that too...' (14005, male, 60 years).

'Look, I know guys myself that have ailments of one thing or another and they do nothing about it. In fact, I know two personal friends of mine who had ailments but, because they were men - I'm tough - they refused to go to the doctor and it finished up costing them their lives. I really believe they'd be alive today if they had have done something about it.' (14005, male, 60 years).

'So I think for I mean it highlighted the need to get onto those sorts of things, for the reasoning - with coughing and some other potential symptoms of lung disease and so on. It just probably brought it to the front of my mind though I guess, if I needed a bit of a prod.' (14005, male, 60 years).

Broader self-awareness of health due to past or present exposure, current health issues or family history were expressed.

'Then I'm an ex-Wittenoom mine worker and I just thought well if it's about lungs, yeah we're in. My husband is a smoker, so he thought it would be a good thing to do' (6002, female, 70 years, worked in asbestos mine).

'I made a promise. My mother was a very was a heavy smoker, so was my dad. Both my parents smoked and my mother had kept on saying me - she actually died of ovarian cancer and she actually said to me please I want you to give it up. It was quite a stressful time when she was dying, but I promised myself that once she does pass on I am going to give that up and I did.' (13007, female, 68 years).

Those who were chronically ill did not respond as well to the intervention as they already had salient symptoms and fewer barriers to help seeking.

'At this stage, because I've got other things happening, my focus has not really been on that. Had it not - if I'd not been in this situation, maybe it would have made the difference.' (8002, female, 70 years, diagnosed with bowel cancer).

'I think I read some of it and it was about if you notice various symptoms contact the doctor, but because I was already under the doctor and so much was happening in other areas with my health, I didn't really have time to focus on that.' (8001, male 69 years, diagnosed with COPD).

**Improve symptom awareness**

A clearer understanding of what symptoms (Objective 2) to look out for and when to seek help from the GP was recalled by many after the intervention.

'...Just the signs. Well, it makes you aware of what to do if you do get chest complaints and what some of the symptoms are that might lead to a lung disease. It does make you more aware. It also explains a lot more than what I knew about lung disease.' (4002, male, 71 years).

'I think it makes you think, it makes you try to remember as well. Because sometimes if you've had that symptom even the month before, you're thinking, going, hang on a minute, did I have that symptom or was it or not? Like a month ago or whatever.' (7017, male, 71 years).

'So if the books were there (in the GP surgery) and the forms were there I just think that would be another wonderful service that the doctor could give their patients. They know who smokes and they know who's got lung problems or whatever. Without the book we would never have known what we now know. I don't know whose idea it was, but it was a good idea.' (13007, female, 68 years).

'I think it should be in general practice. I think anything, whether it be the chest, whether it be for breast, whether it be for any - ovarian, whatever, I think these things should be available in doctor's surgeries...' (12003, female, 68 years).

**Perceptions of the components of the intervention**

Feedback from the self-help manual suggested that this tool is potentially addressing the objective of improving knowledge of symptoms (Objective 2)

**Feedback on the self-help manual**

The self-help manual was described as a valid and useful reference.

'The booklet is also very good, in the fact that it's just got - it's laid out nice and simply, clearly - because I'm a tradie - I'm not an English lit professor - so it's laid out very simply and honestly to me.' (3013, male, 71 years).

'I liked the set out of it. It is clear. It is not over-jargonised. It's not overly wordy and difficult to follow. I think it's quite simple English, which for a simple man like me, it works...' (14014, male, 79 years).

'Well one thing I found looking at the internet versus the book. The internet - I was looking for the prognosis if you get an illness like emphysema and with the internet you don't know what's old and what's new. What's - in other words what's true and what's false anymore ...' (6002, female, 70 years).

'Yeah I could pick it up when I felt like reading it, it is not thrust upon you like when you are watching TV and I learn stuff...' (21012, female, 60 years)

The manual also reinforced the benefits of early intervention (Objective 3).

'So I read about the guy who left it too late in the booklet, I thought, nah, that's not going to be me...' (3013, male, 59 years).

'The booklet really made me aware that it is useful for me to see the doctor early and not let things drag on.' (12003, female, 68 years).

**Feedback on the self-monitoring reminders**

There was evidence that the prompts and reminders had an impact on sanctioning early consultation (Objective 4) and this added weight on an intention to act (Objective 6).

'Yeah it (the intervention) changed my way of thinking. I am normally a let's just wait and see person, I found the email follow up once a month or whatever - I found that very good. It wasn't intrusive. It just sort of - that little jog of memory on the email - because I think I'm like most - I check my emails twice a day normally - morning and night. So when it came through, oh yep, okay, oh that, right - bang. I'll see the doctor.' (21003, male, 76 years).

'What did I see in there that I - just the reminders of what you should do - and I think I'm like a lot of people - where I won't go to the doctor, if I don't think it's a real issue, but this reminded me I should go...' (14016, male, 56 years).

'I remember the 123 rule very clearly now, I now know what to do if I have certain symptoms.' (3018, female, 63 years).

'I had a business up until recently and I just think that texts are instantaneous; whereas I think we get a lot of rubbish coming through on our emails and quite often a lot of people - I don't, but if it's an email that I'm not sure of I often delete it, or it's quiz programs, it's all of that so you can't be bothered. So I think a text is something you don't delete, you actually read it first and then if you want to delete you delete it.' (13007, female, 68 years).

Positive messages were perceived as effective.

'The promotions that I found were always the positive ones. Those ones where you see someone dying or - that was my reaction to it was to turn it over immediately, because I didn't want to see that, and then I'd always think gee, light up a cigarette because it was quite stressful. So, it had the opposite effect on me. I think if you're trying to get someone's attention you need to be positive. It needs to be a positive, like this study.' (8002, female, 70 years).



Table 3. Continued

Different modes of reminders were tailored to individual preferences and were important in promoting self-efficacy.

'I think it has got a role and I think the post cards are a great idea and I think it's made me aware, just the presence of it. I'm a great procrastinator at the best of times I mean, I think that's another thing, it's someone keeping tabs on you' (14014, male, 79 years)

Tackling barriers

There is evidence that the intervention tackled barriers (Objective 5) around lecturing and feelings of guilt and stigma associated with this.

'So I found the consultation very good. It was relaxed, and I wasn't lectured, which is something I really liked.' (21003, male, 76 years).

'I found everybody pleasant and I found it all very flowing.' (3018, female, 63 years).

'Because sometimes I get trouble talking to people. I keep quiet and don't say anything. But there was something about this -I could talk to her all day.' (22029, male, 79 years, diagnosed with lung cancer).

'I was made to feel comfortable and it was really useful...' (21012, female, 74 years).

Each theme is discussed with supporting quotes.

was identified as an important barrier for early consultation in the Scottish study (9), but this was not observed in Australia. All participants reported they felt confident they could get an appointment within 1–3 days. This could suggest that GP accessibility is not a barrier to consulting, at least in metropolitan Perth or Melbourne.

Other studies have also identified similar barriers to consulting. Fear and denial were described in a qualitative lung cancer symptom study by Birt *et al.* (7) and Macleod *et al.* (12). More recently, fear of bad news, feelings of stigma associated with smoking and symptom normalization were described as common barriers by Crane *et al.* (13).

It has been suggested that any future lung screening programs in Australia should incorporate a smoking cessation intervention as part of the approach as this is a valuable teaching opportunity (14). However, this research suggests that this could potentially hinder uptake to screening programmes and act as a possible barrier. Instead, incorporating an intervention such as the CHEST intervention could be more effectively applied in conjunction with any future screening programmes.

In summary, we found evidence that the intervention was achieving the theoretically predicted effects by reducing barriers to consulting, increasing salience of symptoms and self-efficacy to consult. The results of the CHEST Australia trial and the effect on consultation rates for chest symptoms will be reported in 2017.

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Declarations

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