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What do COPD patients do while undergoing their first spirometry examination with a French general practitioner: exploring the experience with a micro-phenomenology approach.

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3 **French general practitioner: exploring the experience with a micro-phenomenology approach.**
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Abstract

Objectives: To explore the patient experience of a spirometry test used to confirm COPD diagnosis in patients with suspected smoking-related COPD.

Design: This is qualitative study, performed with open interviews in adults following a routine spirometry test to confirm COPD diagnosis. Data were analysed with a phenomenological inspired micro-phenomenology approach.

Participants: Eligible patients were recruited through their general practitioner, ten were interviewed.

Setting: Primary care in Centre-Val-De-Loire area, France, in 2018.

Results: Patients reported the spirometry test experience as being unfamiliar but gave meaning to the symptoms they experience. Participants expressed a desire to perform the test well and a willingness to confront their state of health. After the spirometry and the results announced, participants moved through stages of grief from their pre-spirometry self and symptom perception to a state of acceptance. Overall, participants expressed a narrative of an evolving cognitive and corporeal awareness during this spirometry experience. The verbatims describe a cognitive rupture with their chronic illness usually considered “as a way of life”.

Conclusions: A spirometry test goes beyond a diagnostic interest, providing patients with an opportunity to gain awareness of their own state of health, re-frame their breathlessness- related limitations and thus to begin to accept the disease. These may be considered as steppingstones in health behavioural change. Spirometry may have educative potential and support lifestyle changes.

Keywords: *Spirometry; COPD; Primary care; Descriptive phenomenology analysis; Micro-phenomenology*

Strengths and limits of this study

- The subjectivity of the analysts is fully engaged in the interpretation of the data, which can lead to representations and interpretations that are specific to them.
- The use of this interview method allows patients to unfold their own speech rooted in their real-life experience: thus, it decreases the risk of sociability bias and increase the internal consistency.
- Use of spirometry is not widespread in primary care in France, which may account for the small number of participants
- EI characteristics may account for the rather unusual short length of the interview in DPA research with typically last one hour or more.
- This study respected the 32-checklist COREQ about validity criteria for reporting qualitative research

Introduction

Chronic Obstructive Pulmonary Disease (COPD) is currently the fourth leading cause of death in the world but will be the third in 2020. In France, an estimated 3.5 million people are affected by COPD. The annual social cost of this condition is €3.5 billion and mortality is 16,000 patients per year[1, 2] This burden made COPD a public health priority topic in 2018[3].

COPD is a complex, systemic disease that progresses slowly and insidiously, gradually reducing physical activity levels. Phenomenological studies suggest that COPD involves physical, social, psychological and emotional components, meaning patients adapt their lifestyle to their respiratory status over time[4-6]. This adaptive strategy draws people living with COPD into a downward spiral of physical and psychosocial deconditioning that greatly impacts their quality of life[7]. Also the slow disease progression enables many patients to avoid accepting their declining health and eventual mortality[8]. Although some people with COPD engage coping strategies, many do not and instead, become psychologically and emotionally distressed, continuing to deny their ill health[9]. Most patients express “accepting” COPD as “a way of life”[10]. Using this acceptance strategy means that people adapt their daily living activities to their reducing breathing capacities. However, this strategy reinforces the denial coping mechanism, preventing patients from becoming aware of their disease and identifying opportunities [4, 11-13] which may slow down further deterioration of their condition. For an individual to become aware that their feeling of being ill is a disease, they require a clear diagnosis. Understanding the diagnosis allows individuals to accept the symptoms and the slow progression associated with COPD[14,15]. Breaking with denial and recognising personal limitations related to their symptoms forces patients to deal with the illness[6, 16].

Disease acceptance is the first step towards engaging patients to manage their breathlessness[17]. When patients are empowered to manage their health, they experience fewer exacerbations, adhere better to medication and have better quality of life[17-19].

Numerous health behavioural change models have been described and applied in public health interventions to improve quality of life. Some examine patient experience as part of the decision making process with an identified tipping point of opportunity for change[20] One tipping point for patients with a chronic condition is the minimum belief needed in order to make changes that improve their quality of life. For example, importance of the problem in the patient’s life, opportunity in their lifetime to take action, and self-confidence in their ability to achieve this change.

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2 Spirometry is required to diagnosis COPD. When COPD is diagnosed early, patients report fewer
3 exacerbations compared to undiagnosed patients[21, 22]. Thus, using spirometry for early COPD
4 diagnosis is justified in primary care[23-25]. Although the validity and feasibility of spirometry for
5 COPD diagnosis have been shown in primary care[26, 27] its use is suboptimal requiring a motivated
6 clinician [28-30] and patient collaboration to correctly perform the forced exhalation manoeuvre.
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11 Little is known about the effect that the first spirometry test has on raising patient awareness about
12 their symptoms in primary care. Although concepts such as “Lung Age” have been used to foster
13 smoking cessation[31], spirometry has yet to be shown to motivate patients to change their behaviour
14 and accept their diagnosis. These techniques may be used as a steppingstone to improve delivery of
15 care with chronic respiratory conditions.
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21 The aim of this study was to explore the patient experience following a spirometry test in primary
22 care to determine if this experience could meet criteria for health behavioural change.
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29 **Methods**

30 31 Study design

32 33 34 Theoretical framework

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38 We used a micro-phenomenological approach to analyse open interviews with people who had
39 recently had a COPD diagnosis confirmed with spirometry. This approach is inspired by the
40 phenomenological approach, which takes a critical stance for concepts such as “disease”, preferring
41 to frame symptoms as mediated by cultural ideas of illness[32]. Micro-phenomenology is a
42 relatively recent scientific technique that measures characteristics of a personal, introspective view
43 of an experience[33]. This method explores visual, emotional and auditive experiences around a
44 reference event[34, 35]. It was inspired from an explanatory interview developed by the French
45 psychologist Pierre Vermersch. The interviewer evokes a past experience in a participant, who re-
46 enacts the experience during an open interview. This technique allows researchers to explore the
47 reference event from the pre-reflected consciousness (implicit) to the thoughtful consciousness
48 (explicit)[36]. This micro-phenomenology technique has previously been shown to evoke
49 experiences commonly encountered in primary care, such as acute onset of pain in chronic pain
50 diseases[37].
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Inclusion criteria

Patients who had spirometry confirmed, smoking-related COPD, were eligible for the study. Patients were excluded if they had a history of asthma, advanced heart failure, pre-existing COPD diagnosis, did not speak French, or had dementia. The snowball sampling method to ensure a diverse selection of patient characteristics were obtained: age, gender, socio-economic status.

Patient recruitment

Patients with suspected COPD were recruited by general practitioners via a snowball effect in two rural and one urban general practice in the Centre-Val-de-Loire region of France. All GPs were experienced with spirometry and were working in multidisciplinary care centres. Once a general practitioner had informed an eligible participant about the study, the researcher (AB) approached them by telephone. All interested participants took part in the interviews.

The aim of this micro-phenomenological approach is to identify and understand shared features in this lived experience. Data saturation was not required for this micro-phenomenological approach. A sample size of 10 patients was sufficient to elicit common structures.

Study procedure and data collection

An open interview guide including phenomenological prompts and probes focused on the spirometry test experience was developed by the methodological team, (MP and MD). A pilot test was unnecessary for an open interview. Patients were not asked to explain or make sense of the reference event. Speech authenticity was respected and follow-up prompts were intended to encourage participants to recount their personal experience.

The interviews were conducted up to 3 months after the spirometry test was performed and took place in the patient's usual primary care setting. The investigator (AB) introduced himself as a medical student specialised in general practice. He had no previous connection with the participants. After providing their consent to participate in the study, participants were asked to describe their thoughts at three specific time points: before spirometry, at the time of spirometry, and at the announcement of results. The interviews were performed once and recorded with a mobile phone, the verbatim transcribed, anonymised and labelled. Additional field notes were made during the interviews and

1
2 included in the analysis. The participants were given the opportunity to stop at any time and were
3 informed that their responses and personal information would remain anonymous. No time limit was
4 expected for the interview but the time frame was limited to before, during and after spirometry. The
5 course of the interview is given in Appendix 1.
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10 Reliability criteria

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12 The investigator AB was trained in micro-phenomenological technique and all researchers involved
13 in data collection and analysis had previous experience in conducting qualitative research studies.
14 The study was designed and reported in line with COREQ guidelines[38] (Appendix 5).
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19 To avoid subjective influence, investigators remained impartial. A work of putting in suspension
20 theoretical knowledge, the *a priori* and the expected answers was carried out on the part of the analyst
21 and a will to be surprised by the results were respected.
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26 ***Ethical considerations***

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28 All participants signed informed consent forms and all audio recordings were destroyed after
29 transcription and anonymisation. Ethics committee approval was obtained by the local ethical review
30 board (Comité central de réflexion éthique, No. 2017 047). The study was conducted in accordance
31 with all French regulations. (Appendix 4).
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38 ***Data analysis***

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40 The micro-phenomenological approach is a descriptive method for classifying re-lived experiences.
41 The analysis performed was similar to the process described by Valenzuela-Moguillansky et al[39].
42 Topic guides and coding framework are given in Appendix 2 and 3. Before data collection,
43 investigator triangulation was performed to obtain a comprehensive picture. The results a priori were
44 elucidated from four investigators, two general practitioners, one physiotherapist and one narrative
45 medicine specialist. These data were converged and grouped into three categories, (cognitive,
46 perception and feeling) according to the description criteria for experience in the phenomenological
47 approach described in the literature[40]. These three categories enabled us to conceptualise the
48 process with which patients make health behavioural changes after consensual discussion among
49 investigators.
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Emergent categories were captured, respecting the possibility the investigator may be surprised by the results. The emergent categories were derived from the data and presented in order of three time points; before during and after spirometry.

Results

Ten people agreed to participate and were interviewed. There were six males and four females, aged between 40 to 76 years (mean 59). Seven were active smokers and three were ex-smokers. Smoking history ranged from 10 to 40 pack-years (mean: 26). The interviews were carried out between 26/07/2017 and 18/03/2018 and lasted between 20 and 37 minutes. The characteristics of the patients and the interview are summarised in *Table 1*. The transcripts were numbered EX – EY and the emergent categories are presented here in chronological order before, during and after the spirometry text experience. The results are presented here as phenomenological statements in the present tense, including only meaningful words.

Table 1: Patient's characteristics

Before spirometry

Before their first spirometry, the participants described feeling as if they were getting involved in a mysterious experiment. Although willing, they felt apprehensive about discovering the reason for their ill health. "*There's a moment you have to... dot the i's and cross the t's, see what happens, so here we go ... let's go*»(E1). Discovering the device was a new, unusual experience for these patients "*... I was not used to doing this ... these tests ... " (E3) "... because I did not know that stuff..." (E8)*. For some, having confidence in their doctor made the feeling of uncertainty for the future diagnosis more bearable. "*...after all, we never know what is in store for us ..., so we look everywhere but ... it's my doctor, I'm confident ... "(E7)* Patients also reported feeling apprehensive about breathing into the device. "*Then suddenly I was told: "Ok, we will have you blow in the machine "(E1). "In fact; it's super scary!; I say to myself I hope it's okay ... I'm not going to be too sick ..." (E9) "we know but we do not want to know, we have strong doubts "(E1)*. Patients also experienced somatic symptoms of stress before breathing into the device. "*I'm starting to stress" (E10) "my heart is beating at 150" (E1). "I had the feeling my whole body was tense" (E1). "Few sweats and knots in the stomach" (E9). "...my stomach is tying itself in knots and I say to myself, this is happening .. well what are we going to find." (E10)* Patients also expressed feeling stressed about the expected outcome of the

1
2 examination. *"we know but we don't want to know, we have reasonable doubts "(E1) "I tell myself:*
3 *I hope it's okay ... I mean ... I'm not going to be too sick" ... "(E10)*
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8 **During spirometry**

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10 The participants described the spirometry test as being strange, unsettling and painful. The emergent
11 lexical field portrayed the spirometer as discovering a new and unimportant object. *"... it is a tool"*
12 *(E3) "...he makes me blow in the, I don't know what..." (E4) "I blow again in the thing"(E4) ... As*
13 *an appropriation strategy, some patients give the device a nickname" ... I call it a toy ... precisely*
14 *which are design to do the test...to blow in ... in the trumpet ... "(E8).*
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21 The participants described the forced expiratory manoeuvre as an uncomfortable experience *"... this*
22 *horrible thing really tried me" (E8) "... it makes me cough like an animal." (E4) "... 'it's too big for*
23 *me..." (E4). "I felt like there was no resistance ...in the device."(E2) Some even described the*
24 *manoeuvre as being painful to exhale so strongly. "It hurts my head to have blown like that... "(E5).*
25 *"It makes my head turn..." (E7) Nevertheless, patients were engaged and motivated to achieve the*
26 *best result possible. "I tried to blow out and hold as long as possible" (E2) "... I think I've reached*
27 *the end" (E5) "I have no more oxygen in my ... in my lungs" (E6). "...I'm empty..."(E3). "... I breathe*
28 *until I feel that I can't breathe any more" ... (E3). Some felt a desire or an anxiousness to perform*
29 *well. "I feel like I'm not good at blowing" (E2) "As long as I stand tall... well in the rank, and the*
30 *results are good, that's fine "(E5).*
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40 Participants expressed having a heightened awareness about their health status.

41 The participants voiced that spirometry made them conscious that there was a problem with their
42 health. *"... I understand it ... since I felt it ..." (E3). "I'm not surprised ..." (E7). "It affects you" (E1)*
43 *Furthermore, they expressed a realisation of their limitations. "By the finding, I had trouble expelling*
44 *a lot of air" (E3). "...the inside of it ... makes a noise ... "(E9)." I say to myself ... I've lost my breath*
45 *... "(E9)" ... well, it's when I heard my lungs that ... that I knew I did not blow well "(E9).*
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52 **After spirometry**

53 The participants also voiced being apprehensive about getting the results and felt conflicted between
54 wanting to have a diagnosis and being afraid of the diagnosis. Feelings of grief were expressed when
55 asked to recall the moment the spirometry results were announced. These expressions of grief
56 followed the stages described by E. Kubler-Ross[41]:
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4 1. shock5 *"... I tell myself it was not good news ..."* (E3)6
7 *"Well the end of consultation... the rest was much less important for me ..."* (E3)8
9 2. denial10 *"For me it's not suitable ... it's the system I do not say the device ... it's the system ... "well*
11 *after I say ... he is kidding"* (E8)12
13 *"I thought this was a joke"* (E5)14
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17 3. sadness and cognitive saturation:18 *"Well, I tell you I felt shame, sadness"* (E1)19
20 *"I was glad when it ended, I think I had had enough for that day, I had heard enough ..."* (E1).21
22
23
24 4. Anger and shame25 *"... it's very distressing (tears)... but there is more to this side ... this mortifying side last*
26 *longer"*(E1)27
28 *"... if you are told that you have weakness somewhere... it's a little upsetting"*(E2)29
30 *"I'm afraid that ... I'll have cancer"* (E10)31
32 *"Well it breaks my heart ... I have a friend who died of that because of cigarettes ... a heart*
33 *attack"* (E6)34
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37
38 5. Expectation for more information:39 *"... I think ... I was expecting more explanations ..."* (E7)40
41 *"... I'm thinking ... I'm going to try to smoke less ..."* (E9)42
43 *"... I'm thinking about stopping smoking..."* (E6)44
45 *"I think I should try to quit"* (E10)46
47 *"I tell myself that I smoke too much"* (E9)48
49
50 6. Pain and depression51 *"... it is like a sentence of the condemned"*(E1)52
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55 7. Rebuilding56 *"...you know, when you have to go to war... well, it's a bit similar»"*(E1)57
58 *"I can cope with COPD"* E1)59
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2 *"I tell myself she's right" (E6)*

3 *"Well...I feel like I'm starting to realise" (E10)*

4 *"...now, I can look to the future" (E1)*

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9 8. The consultation even enabled some patients to accept the disease

10 *"there's a kind ... of ... I would call it: acceptance (E1)*

11 *" ... well it is a diagnosis which I expected "(E7)*

12 *"... he tells me it's a ... it's a chronic bronchitis " (E9)*

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17 The consultation that follows the spirometry test is also a meaningful part of the patients' experience.

18 *"He concludes that I do not have asthma" (...) "it somehow reassures me" (E3)*

19 *"... I felt a little improvement with his medication ... so what happens to me is that well ... that*
20 *reassures me a little bit" (E3).*

21 22 23 24 25 26 27 **Discussion:**

28
29 The experiences the participants reported indicate that spirometry can instigate health behavioural
30 change. Although there have been no other reports of spirometry experience using micro-
31 phenomenology, our results are consistent with the life history of a COPD patient and may provide
32 a breakthrough point for change. These findings indicate that a change occurs when people with
33 confirmed COPD have a spirometry test. These people change from a state where they are willing
34 but apprehensive about the diagnosis and advance to a state of acceptance. This process is similar to
35 the stages of grief described by Kubler Ross[42] and corresponds with the step wise processes of
36 the change model described by Prochaska and Di Clemente[20].

37 Indeed, we observed that a spirometry test creates a situation which combines three characteristics
38 of health behavioural change models; importance, opportunity and confidence[43]. Importance
39 refers to the magnitude of the problem for the patient, opportunity refers to the timing to take
40 action, and confidence is the self-belief in success. Combining these three characteristics of
41 behavioural change motives people living with a chronic disease to engage in self-management with
42 shared decision making[44, 45].

43 Thus, spirometry may be a key moment for patient empowerment in COPD.

44 45 46 47 48 49 50 51 52 53 54 55 56 57 **Importance**

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2 Our findings highlight that spirometry as diagnostic tool is important to participants. The
3 participative nature of the spirometry test, elicited a sense of urgency, which encourages the patient's
4 drive to become actively involved in managing their health. This active participation was illustrated
5 by the desire participants expressed to perform well: "*I tried to blow in and hold for as long as*
6 *possible*" (E1). Spirometry also enabled the participants to confront their state of their own health and
7 their limits. "*I understand*", "*I heard my lungs*", "*I'm not surprised*" These results show that
8 participants understood that their lungs were the source of their ill health, unlike other qualitative
9 research studies using thematic analysis, which suggested that patients passively accepted and
10 resigned themselves to their circumstance[11]. When patients actively participate in measuring their
11 physical limits, they gain awareness about the impact of the disease. "*what are we going to find?*"
12 (E10) This shows that the patients understand the importance and magnitude of their disease as
13 described in the motivation interviewing model[46].
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24 **Opportunity**

25 During spirometry the participants described the experience as being uncomfortable but resembled
26 the symptoms with which they live daily. These illness perceptions are meaningful as they refer to
27 the participants' own life experience. After spirometry, patients expressed a cognitive intention to
28 stop smoking. "*I should try to quit(E10)*" The micro-phenomenological inspired approach adopted in
29 this study, enabled us to explore the patients' emotional experience during spirometry in primary care
30 settings with the empathic support of their own GP. Our data on perception, cognition and emotion
31 suggest that spirometry testing may be an optimal time for primary care clinicians to support their
32 patients to make behavioural changes, such as increasing physical activity or reducing smoking. This
33 reflects similar accounts where lung function testing is an opportune moment to change patient
34 attitudes toward smoking cessation[47, 48].
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45 **Confidence**

46 Although the spirometry test felt strange and forced participants to struggle with their symptoms,
47 they remained confident in their ability to manage their health with their doctor, "*we never know*
48 *what is in store for us, but ... it's my doctor, I'm confident*" (E3). Also, verbatim from the debriefing
49 indicated that participants were confident in their ability to reduce or even stop smoking. This self-
50 confidence is a key step in the process of changing behaviour[43].
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56 **Strengths and limits of the study**

1
2 To our knowledge, this is the first phenomenological study on spirometry for COPD conducted to
3 date. MP analysis from open elicitation interview has been used in the fields of psychiatry, pedagogy,
4 neuroscience however few studies have applied this technique in primary care[35].
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9 Although this micropheomenological-inspired analysis is limited by the qualitative nature of the
10 study, the open elicitation interview gave us access to participant emotions during spirometry in a
11 primary setting. Although we were aware that researcher attitudes may have influenced the data
12 interpretation, investigator triangulation reduced this possibility of bias. Also, by employing an open
13 elicitation interview participant were able to retell their experience as they lived it, in their own words.
14 This decreased the potential for sociability bias and increased the internal consistency.
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19 The time frame explored through the interview was limited to the short period around the spirometry
20 examination, and some patients had little insight into the spirometry experience that they underwent.
21 This may account for the unusually short interview length for a phenomenological approach, which
22 typically lasts for at least one hour. Other elements surrounding the spirometry experience such as
23 the context of realisation or the relationship with the health professional involved in the spirometry
24 test experience could have been further explored.
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29 Although the sample size was small, it was within recommended limits for DPA research and may
30 have been restricted by the limited use of spirometry in primary care in France[25, 49].
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34 ***Perspectives***

35
36 The unique choice of combining a micro-phenomenological analysis and an open elicitation
37 interviewing technique highlighted that spirometry is useful as a diagnostic tool, as well as a tool to
38 empower people with COPD to drive behavioural change. This is consistent with other studies that
39 explored the patient experience of a technical act where patients were more concerned with the
40 attitude of the team and the personal attention they received[49]. Moreover, a recent paper on mobile
41 health in COPD showed that personalised feedback is needed to engage patients[44]. These results
42 highlight the various fields involved when patients experience a medical act. This suggests that there
43 is a need to investigate the patient experience concerning other technical gestures in primary care to
44 promote self-confidence in patient self-management, facilitated by a health professional caring
45 attitude.
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56 **Conclusions**

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2 Our findings indicate that with spirometry, people living with COPD are capable of recognising their
3 own limitations, adapting their activities to their lung capacity and displaying a desire to modify
4 behaviour. Spirometry gives patients an opportunity to express an intention to change.
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14 **Author statement**

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17 At the time of data collection:

18 M.BREMOND : physiotherapist, Msc

19 A.BERTHELOT : general practitioner student

20 H.BRETON : Sociologist, PhD

21 L.PLANTIER : professor physiologist, PhD

22 M.PAUTRAT : senior registrar, general practitioner MD, Msc

23
24
25 Author's contribution :

26 M.P. and M.B. conceived the original idea and designed the model

27 M.B. and A.B. carried out the experiment, and wrote the manuscript

28 H.B. and L.P. helped supervise the project

29 M.P. directed the project

30 All authors provided critical feedback and helped shape the research analysis on manuscript.
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34 **Data statement**

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36 The full dataset is available from the corresponding author.
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40 **Patient and Public Involvement statement**

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42 Neither the patient nor the public were involved in the design, conduct, reporting or dissemination
43 plans of our research.
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Appendix 1 : course of the interview

Structure globale du déroulement entretien explicitation selon P. Vermersch

- **Contextualisation** de l'évènement vécu à explorer : L'interviewer et l'interviewé s'accorde sur l'évènement du vécu, identifiable dans le temps et dans l'espace avec un début et une fin.

-**Établissement d'un contrat de communication** : l'interviewer doit donner son accord pour évoquer l'évènement de référence afin de ne pas induire une « intrusion » mais une verbalisation spontanée. L'entretien début par une phrase d'accroche de type : « *Mr ou Mme...je vous propose si vous en êtes d'accord, de laisser revenir un moment de...* »

-**Initialisation** : début de l'entretien, mise en confiance et balayage temporel du vécu.

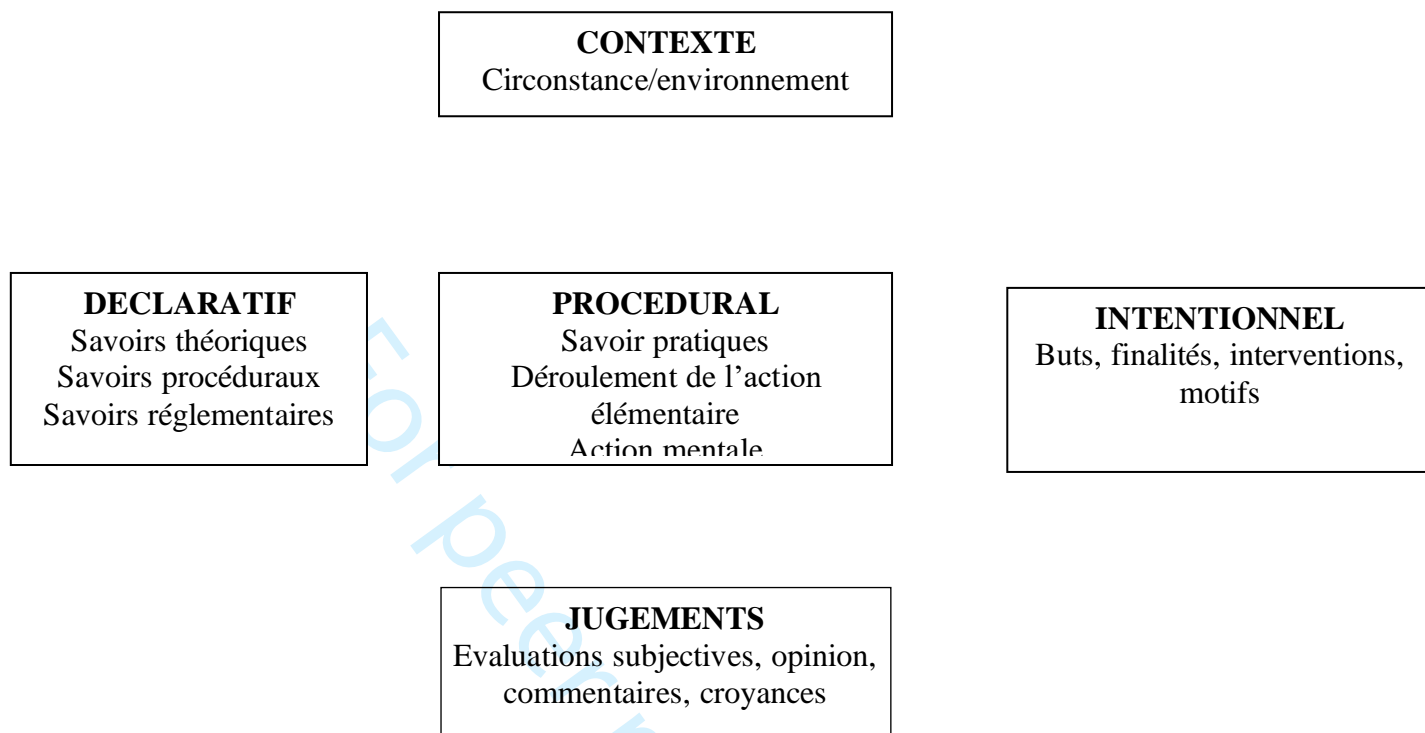
-**Guidage vers la verbalisation de l'évènement et la position de parole incarnée** : Le sujet doit être dans l'évocation, c'est-à-dire la verbalisation authentique de son vécu. L'interviewer vérifie la présence des indicateurs habituels de l'évocation : ralentissement de la vitesse d'élocution, baisse de tonalité, fuite du regard, langage plus sensoriel, langage corporel avec gestes d'accompagnement

-**Identification des informations satellites de l'action** : Description ci-dessous du recueil d'information par l'entretien d'explicitation

-**Focaliser** : L'interviewer recentre ses questions sur un point du vécu particulier

-**Élucider** : L'interviewer affine son questionnement et ses relances en évitant d'utiliser le « pourquoi » pour guider la verbalisation d'une information pertinente et obtenir un niveau de description conforme avec l'objectif de recherche.

-**Réguler** : L'interviewer veille à ce que le sujet reste en évocation, régule ses échanges, ralentit la vitesse d'élocution.

Appendix 2 : Topic guides

Le système des informations satellites de l'action

Appendix 3 : coding framework

Les différentes phases d'une analyse phénoménologique interprétative (33)

ETAPES	OBJECTIFS
Étape 1 : écoute, lecture et relecture de l'entretien	Immersion dans les données et entrée dans le monde du participant (démarche compréhensive)
Étape 2 : annotations initiales	Production d'un ensemble de notes et de commentaires compréhensifs et détaillés sur les données en considérant le contenu sémantique du discours ainsi que le langage utilisé par le participant
Étape 3 : développement de thèmes émergents	Production de thèmes reflétant à la fois le discours du participant et la démarche d'interprétation active de l'analyste
Étape 4 : recherche de liens entre les thèmes émergents	Production d'une structure capable de rendre compte des aspects les plus intéressants et importants du récit du participant en regroupant et mettant en liens les thèmes produits lors de l'étape précédente
Étape 5 et 6 : passage au cas suivant et recherche de liens entre les entretiens	Application des étapes 1 à 4 sur un nouvel entretien puis recherche des liens entre les différents entretiens sélectionnés pour l'analyse

Appendix 4 : Ethical considerations

**GROUPE ETHIQUE D'AIDE A LA RECHERCHE CLINIQUE POUR LES PROTOCOLES DE
RECHERCHE NON SOUMIS AU COMITE DE PROTECTION DES PERSONNES
ETHICS COMMITTEE IN HUMAN RESEARCH**

AVIS

Responsable de la recherche : Dr Anthony BERTHELOT

Titre du projet de recherche : Exploration du ressenti des patients bénéficiant d'un dépistage de la Broncho Pneumopathie Chronique Obstructive (BPCO) en médecine générale par spirométrie

N° du projet : 2017 047

Le groupe éthique d'aide à la recherche clinique donne un avis

- FAVORABLE
- DÉFAVORABLE
- SURSIS A STATUER
- DÉCLARATION D'INCOMPÉTENCE

au projet de recherche n° 2017 047

A Tours, le

A handwritten signature in blue ink, appearing to read 'B. Birmelé', is written over the printed name.

Dr Béatrice Birmelé
Directrice ERERC

RÉCÉPISSÉ

DÉCLARATION NORMALE

Numéro de déclaration

2057086 v 0

du 25 avril 2017

Monsieur BERTHELOT Anthony
 FACULTE DE MEDECINE DE TOURS
 DEPARTEMENT UNIVERSITAIRE DE MEDECINE
 GENERALE
 10 BOULEVARD TONNELLE
 37032 TOURS CEDEX 1

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Tél. : 0611802624**Fax. :****Traitement déclaré**

Finalité : THÈSE D'EXERCICE DE MÉDECINE DONT LE SUJET PORTE SUR L'EXPLORATION DU RESENTI DES PATIENTS QUI SONT DÉPISTÉS PAR LEUR MÉDECIN TRAITANT D'UNE MALADIE PULMONAIRE CHRONIQUE APPELÉE BPCO PAR LE BIAIS D'UNE SPIROMÉTRIE. LES PATIENTS SONT INVITÉS PAR LEUR MÉDECIN TRAITANT À PARTICIPER À UN ENTRETIEN POUR EXPLORER LEUR VÉCU DE CE DÉPISTAGE ET REMPLISSENT LE FORMULAIRE DE CONSENTEMENT. LES ENTRETIENS SONT RÉALISÉS SELON LA MÉTHODE DE L'ENTRETIEN D'EXPLICITATION, C'EST À DIRE QUE LE PATIENT VERBALISE...

Fait à Paris, le 25 avril 2017
 Par délégation de la commission



Isabelle FALQUE PIERROTIN
 Présidente

Appendix 5 : COREQ Checklist

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist.			
No.	Item	Guide questions/description	Response/page number referenced
Domain 1: Research team and reflectivity			
Personal characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Page 7 (Patient recruitment section): “They were all performed by the same investigator (AB), a MD student of general medicine”
2.	Credentials	What were the researcher’s credentials? E.g. PhD, MD	Page 19 (Author statement section): “at the time of data collection : M.BREMOND : physiotherapist, Msc A.BERTHELOT : GP student H.BRETON : Sociologist, PhD L.PLANTIER : physiologist, PhD M.PAUTRAT : senior registrar, GP MD, Msc”
3.	Occupation	What was their occupation at the time of the study?	Page 19 (Author statement section, as above)
4.	Gender	Was the researcher male or female?	Not relevant in the context of this study as would not have affected conduct or analysis of focus groups on pain assessment.
5.	Experience and training	What experience or training did the researcher have?	Page 14 (Discussion section): “All researchers involved in data collection and analysis had conducted and been involved in prior qualitative research studies.”
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Not applicable as professional relationships were used as the basis for recruitment (snowballing).
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research.	Page 7 (Patient recruitment section): “investigator (AB), a MD student of general medicine without any connection to any of the participants”

			Participants were also given a brief background to the rationale of the study when they signed the informed consent.
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic.	<p>Bias/assumptions reported on Page 14 (Discussion section): “A work of putting in suspension theoretical knowledge, the a priori and the expected answers was carried out on the part of the analyst and a will to be surprised by the results were respected.”</p> <p>Reasons and interest in the topic area reported on Page 5 (Introduction section): “spirometry has yet not been associated with increased motivation for healthy behaviour ”</p>
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	<p>Page 5 (Exploration of the experience section): “A phenomenological analysis inspired by Micro-Phenomenology (MP) approach was used. Micro-phenomenology is a method of descriptive phenomenology inspired by the ‘entretien d'explicitation’ [...] a method of open non-inductive interview ”</p>
Participant selection			
10.	Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	<p>Page 6 (Patient recruitment section): “ Patients were recruited by the snowball effect in several rural or urban general practices ”</p>

11.	Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 6 (Patient recruitment section): “ They were approached by AB by phone after their GP told them about the study”
12.	Sample size	How many participants were in the study?	Page 8 (Results section): “ Six men and four women, aged from 40 to 76 years (mean :59), were interviewed”
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	Not applicable- All who registered interest took part in the interviews.
Setting			
14.	Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 7 (Patient recruitment section): “ The interviews took place in the usual primary care settings.”
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	Not applicable- no other persons present during conduct of interviews.
16.	Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Participant characteristics: Table 1.
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Not applicable as no specific interview guide
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	Not applicable - interviews are not repeated.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 7 (Patient recruitment section): “The interviews were recorded, transcribed verbatim, and anonymized.”
20.	Field notes	Were field notes made	Page 7 (Patient recruitment section):

		during and/or after the interview or focus group?	“Field notes collected by the researchers during the conduct of interviews were used to provide additional context to the analytical process.”
21.	Duration	What was the duration of the interviews or focus group?	Page 8 (Results section): “ The interviews lasted between 20 and 37 minutes.”
22.	Data saturation	Was data saturation discussed?	Not applicable as not an aim of this micro-phenomenological approach.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not applicable as transcripts were not returned to participants.
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Page 7 (Patient recruitment section): “ This descriptive phenomenological analysis has been carried out by all the researchers following the process described in the literature.”
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Not applicable for this micro-phenomenological approach.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Page 8 (Results section): Codors not defined what would be considered a significant theme prior to data analysis but for clarity "The results were presented chronologically from before spirometry, during spirometry, and after spirometry. ”.
27.	Software	What software, if applicable, was used to manage the data?	No specific software was used, only Excel to help with classification
28.	Participant checking	Did participants provide feedback on the findings?	Not applicable as participants did not provide feedback on the data/findings.
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number.	Page 8-Page 12 (Results section): Quotations are presented throughout the text alongside interpretations.
30.	Data and findings consistent	Was there consistency between the data presented and the	Page 8-12 (Results section): Quotations are presented alongside interpretations for transparency between data and

		findings?	findings.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Page 8-12 (Results section): the results have been presented chronologically and the most symbolic quotations have been organised in this chronology
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	The micro-phenomenological approach does not make it possible to list certain major or minor themes in the results. The discussion gives meaning to the most significant quotations

BMJ Open

A micro-phenomenological approach to explore the patient experience during an initial spirometry examination to diagnose COPD in general practice in France

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Primary Subject Heading:	General practice / Family practice
Secondary Subject Heading:	Respiratory medicine
Keywords:	PRIMARY CARE, Substance misuse < PSYCHIATRY, Chronic airways disease < THORACIC MEDICINE

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44 27

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31 **Abstract**

32 **Objectives:** To explore the patient experience of a spirometry test used to confirm COPD diagnosis
33 in patients with suspected smoking-related COPD.

34 **Design:** This is a qualitative study, performed with open interviews in adults following a routine
35 spirometry test to confirm COPD diagnosis. Data were analysed with a phenomenological-inspired
36 micro-phenomenology approach.

37
38 **Participants:** Eligible patients were recruited through their general practitioner, ten were
39 interviewed.

40
41 **Setting:** Primary care in Centre-Val-De-Loire area, France, in 2018.

42 **Results:** Participants reported the spirometry test experience as being unfamiliar but gave meaning
43 to the symptoms they experience. Participants expressed a desire to perform the test well and a
44 willingness to confront their state of health. After the spirometry had been completed and the results
45 announced, participants moved through stages of grief from their pre-spirometry self and symptom
46 perception to a state of acceptance. Overall, participants expressed a narrative of an evolving
47 cognitive and corporeal awareness during this spirometry experience. The verbatims describe a
48 cognitive rupture with their chronic illness usually considered as a “way of life”.

49 **Conclusions:** A spirometry test goes beyond a diagnostic interest, providing patients with an
50 opportunity to gain awareness of their own state of health, re-frame their breathlessness-related
51 limitations and thus begin to accept the disease. These may be considered as steppingstones in health
52 behavioural change. Spirometry may have educative potential and support lifestyle changes.

53
54 **Keywords:** *Spirometry; COPD; Primary care; Descriptive phenomenology analysis; Micro-*
55 *phenomenology*

1
2 58 **Strengths and limitations of this study**
3 59

- 4 60 • The researchers coded the verbatim separately and cross checked between them avoid
5
6 61 subjective bias.
7
8 62 • This interview method allows participants to express themselves freely about their real-life
9
10 63 experience: thus, it decreases the risk of sociability bias and increases the internal consistency.
11
12 64 • The use of spirometry is not widespread in primary care in France, which may account for the
13 65 small number of participants.
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15 66 • The elicitation interview may have been limited in this specific population due to a low level
16
17 67 of insight into the procedure. This may account for the unusually short interview length
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19 68 compared with the descriptive phenomenological approach.
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1 2 70 **Introduction**

3
4 71 Chronic Obstructive Pulmonary Disease (COPD) is currently the fourth leading cause of death in the
5 72 world but will be the third in 2020, and in France, an estimated 3.5 million people are affected. The
6 73 annual social cost is €3.5 billion and mortality is 16,000 patients per year[1, 2] This burden made
7 74 COPD a public health priority topic in 2018[3].

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12 75 COPD is a complex, systemic disease that progresses slowly and insidiously, gradually reducing
13 76 physical activity levels. Phenomenological studies suggest that COPD involves physical, social,
14 77 psychological and emotional components, meaning patients adapt their lifestyle to their respiratory
15 78 status over time[4-6]. This adaptive strategy draws people living with COPD into a downward spiral
16 79 of physical and psychosocial deconditioning that greatly impacts their quality of life[7]. Also, the
17 80 slow disease progression enables many patients to avoid accepting their declining health and eventual
18 81 mortality[8]. Although some people with COPD engage coping strategies, many do not and instead,
19 82 become psychologically and emotionally distressed, continuing to deny their ill health[9]. Most
20 83 patients express “accepting” COPD as a “way of life”[10]. Using this acceptance strategy means that
21 84 people adapt their daily living activities to their reducing breathing capacities. However, this strategy
22 85 reinforces the denial coping mechanism, preventing patients from becoming aware of their disease
23 86 and identifying opportunities [4, 11-13] which may slow down further deterioration of their condition.
24 87 For an individual to become aware that their feeling of being ill is a disease, they require a clear
25 88 diagnosis. Understanding the diagnosis allows individuals to accept the symptoms and the slow
26 89 progression associated with COPD[14, 15]. Breaking with denial and recognising personal limitations
27 90 related to their symptoms forces patients to deal with the illness[6, 16].

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33 91 Disease acceptance is the first step towards engaging patients to manage their breathlessness[17].
34 92 When patients are empowered to manage their health, they experience fewer exacerbations, adhere
35 93 better to medication and have better quality of life[17-19]. Some health behavioural change models
36 94 examine patient experience as part of the decision-making process with an identified tipping point of
37 95 opportunity for change[20]. One tipping point for patients with a chronic condition is the minimum
38 96 belief needed in order to make changes that improve their quality of life. For example, the importance
39 97 of the problem in the patient’s life, the level of opportunity in their lifetime to take action, and self-
40 98 confidence in their ability to achieve this change.

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46 99 Spirometry is required to diagnosis COPD. When COPD is diagnosed early, patients report fewer
47 100 exacerbations compared to undiagnosed patients[21, 22]. Thus, using spirometry for early COPD
48 101 diagnosis is justified in primary care[23-25]. Although the validity and feasibility of spirometry for

1
2 102 COPD diagnosis have been shown in primary care[26, 27], its use is suboptimal, requiring a
3
4 103 motivated clinician [28-30] and patient collaboration to correctly perform the forced exhalation
5
6 104 manoeuvre.
7

8 105 Little is known about the effect the first spirometry test has on raising patient awareness about their
9
10 106 symptoms in primary care. Although concepts such as “Lung Age” have been used to foster smoking
11
12 107 cessation[31], spirometry has yet to be shown to motivate patients to change their behaviour and
13
14 108 accept their diagnosis. These techniques may be used as a steppingstone to improve delivery of care
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16 109 to patients with chronic respiratory conditions.
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18 110 The aim of this study was to explore the patient experience following a spirometry test in primary
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20 111 care to determine if this experience could meet criteria for health behavioural change.
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26 113 **Methods**

27 114 *Study design*

28 115 The phenomenological interview
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33 118 Micro-phenomenology is a novel analytic technique to measure the introspective, personal view of
34
35 119 an experience by exploring visual, emotional and auditive experiences around the reference event
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37 120 [32-34]. This approach was inspired by the more complex phenomenological approach, which
38
39 121 challenges the concept of disease, whereby signs and symptoms are mediated by cultural ideas of
40 122 illness.[35] The interview technique was inspired by an explanatory interview developed by the
41
42 123 French psychologist Pierre Vermersch. Using this technique to elicit the patient experience, the
43
44 124 interviewer evokes a past experience within the interviewee, who in turn re-enacts the experience
45 125 during an open interview. This technique allows researchers to explore the reference event from the
46
47 126 pre-reflected consciousness (implicit) to the thoughtful consciousness (explicit)[36]. This micro-
48
49 127 phenomenology technique has previously been shown to evoke experiences commonly encountered
50
51 128 in primary care, such as acute onset of pain in chronic pain diseases[37].
52

53 130 *Participants*

54 131
55 132 Ten adults who had spirometry-confirmed, smoking-related COPD, participated in this study of
56
57 133 which, six were male and four female, aged between 40 to 76 years (mean 59). The mean age was 59
58
59 134 years, range (40 -76) and lung function (mean FEV1) was 62% (range: 35-85%). There were of
60

1
2 135 which. Seven were active smokers and three were ex-smokers and a smoking history that ranged
3
4 136 from 10 to 40 pack-years (mean 26). Patients were excluded if they had a history of asthma, advanced
5
6 137 heart failure, pre-existing COPD diagnosis, did not speak French or had dementia. The snowball
7
8 138 sampling method was used to ensure a diverse selection of patient characteristics were obtained: age,
9
10 139 gender, socio-economic status. Six participants lived in a rural environment, four had retired, five
11
12 140 were in current employment and one was unemployed. Among those with current or previous
13
14 141 employment, six were manual workers, three were office-based workers and one was a health
15
16 142 professional. All but three participants were being treated with inhaled therapy for their respiratory
17
18 143 symptoms.

19 144 *Patient recruitment*

20
21 145 Patients with suspected COPD were recruited by general practitioners (GPs) in two rural and one
22
23 146 urban general practice in the Centre-Val-de-Loire region of France. All GPs were experienced with
24
25 147 spirometry and were practicing in multidisciplinary care centres. Once a general practitioner had
26
27 148 informed an eligible participant about the study, the researcher (AB) approached them by telephone.
28
29 149 All interested participants took part in the interviews.

31 150 *Study procedure and data collection*

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33
34 151 The research team, (MB, AB and MP) developed an open interview guide with phenomenological
35
36 152 prompts and probes focused on the spirometry test experience. A pilot test was unnecessary for an
37
38 153 open interview. Patients were not asked to explain or make sense of the reference event. Speech
39
40 154 authenticity was respected, and follow-up prompts were intended only to encourage participants to
41
42 155 recount their personal experience. Data saturation was not required for this micro-phenomenological
43
44 156 approach as the objective was to identify and understand shared features in this lived experience.
45
46 157 Thus, a sample size of 10 patients was considered sufficient to elicit common structures.

47
48 158 The interviews were conducted up to 3 months after the spirometry test was performed and took place
49
50 159 in the patient's usual primary care setting. The investigator (AB) introduced himself as a medical
51
52 160 student specialised in general practice. He had no previous connection with the participants. After
53
54 161 providing their consent to participate in the study, participants were asked to describe their thoughts
55
56 162 at three specific time points: before spirometry, at the time of spirometry and at the announcement of
57
58 163 results. The interviews were performed once and recorded with a mobile phone, the verbatim
59
60 164 transcribed, anonymised and labelled. Additional field notes were made during the interviews and
60 165 included in the analysis. The participants were given the opportunity to stop at any time and were

1
2 166 informed that their responses and personal information would remain anonymous. No time limit was
3
4 167 expected for the interview apart from the defined timepoints. The interview was structured according
5
6 168 to P. Vermersch[36].
7

8 169 ***Reliability criteria***

10
11 170 The investigator AB was trained in micro-phenomenological technique and all researchers involved
12
13 171 in data collection and analysis had previous experience in conducting qualitative research studies.
14

15
16 172 To avoid subjective influence, investigators remained impartial, laying aside theoretical knowledge,
17
18 173 *a priori* and the expected answers. Analysts remained impartial and willing to be surprised by the
19
20 174 results.
21

22 175 23 176 ***Ethical considerations***

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25 177 All participants signed informed consent forms and all audio recordings were destroyed after
26
27 178 transcription and anonymisation. Ethics committee approval was obtained by the local ethical review
28
29 179 board (Comité central de réflexion éthique, No. 2017 047). The study was conducted in accordance
30
31 180 with all French regulations.
32

33 34 181 35 182 ***Data analysis***

36
37 183 The analysis was performed in accordance with the process described by Valenzuela-Moguillansky
38
39 184 et al[38]. The coding framework consisted of six steps as outlined in Table 1. Before data analysis,
40
41 185 investigator triangulation was performed to obtain a comprehensive picture. The results *a priori* were
42
43 186 elucidated from four investigators, two general practitioners, one physiotherapist and one narrative
44
45 187 medicine specialist. The investigators used an iterative process and were careful to allow the themes
46
47 188 to emerge from the data. After consensual discussion among investigators these data were converged
48
49 189 and grouped into three categories, according to the description criteria for experience in the
50
51 190 phenomenological approach (cognitive, perception and feeling) [39]. These three categories provide
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53 191 a conceptual framework in which patients make health behavioural changes.
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1

2 195 Table 1: The six steps of coding framework

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Steps	OBJECTIFS
Step 1: listen, read and reread the interview	Data immersion and entry into the participant's world (comprehensive approach)
Step 2: initial annotations	Produce a set of comprehensive and detailed notes and comments on the data considering the semantic content of the speech as well as the language used by the participant
Step 3: Develop emerging themes	Produce themes reflecting both the participant's discourse and the analyst's active interpretation process
Step 4: Identify links between emerging themes	Produce a structure capable of reflecting the most interesting and important aspects of the participant's story by grouping and linking the themes produced in the previous step
Step 5 and 6: move on to the next case and search for links between the interviews	Apply steps 1 to 4 on a new interview then search for links between the different interviews selected for analysis

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Results

Ten people agreed to participate and were interviewed. The interviews were carried out between 26/07/2017 and 18/03/2018 with a mean duration of 27.15mins (range 20-37 mins). The transcripts were numbered EX – EY and the emergent categories are presented here in chronological order before, during and after the spirometry text experience. To illustrate the context for the reported

1
2 202 experiences, the emergent categories derived from the data are presented chronologically; before
3
4 203 during and after spirometry, in the present tense, including only meaningful words.
5

6 204 **Before spirometry**

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8
9
10 206 Before their first spirometry, the participants described feeling as if they were getting involved in a
11
12 207 mysterious experiment. Although willing, they felt apprehensive about discovering the reason for
13
14 208 their ill health. *"There's a moment you have to...dot the i's and cross the t's, see what happens, so
15 209 here we go...let's go"* (E1). Discovering the device was a new, unusual experience for these patients
16
17 210 *"I was not used to doing this ... these tests ..."* (E3), *"...because I did not know that stuff"* (E8). For
18
19 211 some, having confidence in their doctor made the feeling of uncertainty for the future diagnosis more
20
21 212 bearable. *"...after all, we never know what is in store for us, ... so we look everywhere but ... it's my
22 213 doctor, I'm confident ..."* (E7). Patients also reported feeling apprehensive about breathing into the
23
24 214 device. *"Then suddenly I was told: 'Ok, we will have you blow in the machine'"*(E1). *"In fact, it's
25 215 super scary!; I say to myself I hope it's okay ... I'm not going to be too sick ..."* (E9). *"We know but
26 216 we do not want to know; we have strong doubts"* (E1). Patients also experienced somatic symptoms
27
28
29 217 of stress before breathing into the device. *"I'm starting to stress"* (E10), *"my heart is beating at 150"*
30
31 218 (E1). *"I had the feeling my whole body was tense"* (E1). *"Few sweats and knots in the stomach"*
32
33 219 (E9). *"My stomach is tying itself in knots and I say to myself, 'this is happening .. well, what are we
34 220 going to find?'"* (E10). Patients also expressed feeling stressed about the expected outcome of the
35
36 221 examination. *"We know, but we don't want to know; we have strong doubts"* (E1). *"I tell myself: 'I
37 222 hope it's okay ... I mean ... I'm not going to be too sick' ..."* (E10).
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42 225 **During spirometry**

43 226 The participants described the spirometry test as being strange, unsettling and painful. The emergent
44
45 227 lexical field portrayed the spirometer as discovering a new and unimportant object. *"It is a tool"* (E3),
46
47 228 *"...he makes me blow in the, I don't know what..."* (E4), *"I blow again in the thing."* (E4). As an
48
49 229 appropriation strategy, some patients give the device a nickname. *"I call it a toy ... precisely which
50 230 are design to do the test...to blow in ... in the trumpet ..."* (E8).
51
52 231

53
54 232 The participants described the forced expiratory manoeuvre as an uncomfortable experience. *"This
55 233 horrible thing really tried me."* (E8) *"It makes me cough like an animal."* (E4) *"It's too big for me."*
56
57 234 (E4). *"I felt like there was no resistance ...in the device"* (E2). Some even described the manoeuvre
58
59 235 as being painful to exhale so strongly. *"It hurts my head to have blown like that..."*,(E5). *"It makes
60*

1
 2 236 *my head turn...*” (E7). Nevertheless, patients were engaged and motivated to achieve the best result
 3
 4 237 possible. *“I tried to blow out and hold as long as possible ...”* (E2) *“I think I've reached the end.”*
 5 238 (E5) *“I have no more oxygen in my ... in my lungs”* (E6). *“I'm empty...”* (E3). *“I breathe until I feel*
 6
 7 239 *that I can't breathe any more”* (E3). Some felt a desire or an anxiousness to perform well. *“I feel like*
 8
 9 240 *I'm not good at blowing”* (E2), *“As long as I stand tall... well in the rank, and the results are good,*
 10
 11 241 *that's fine ”* (E5).

12 242
 13

14 243 Participants expressed having a heightened awareness about their health status.

15
 16 244 The participants voiced that spirometry made them conscious that there was a problem with their
 17
 18 245 health. *“I understand it ... since I felt it ...”* (E3). *“I'm not surprised ...”* (E7). *“It affects you”* (E1).
 19 246 Furthermore, they expressed a realisation of their limitations. *“By the finding, I had trouble expelling*
 20
 21 247 *a lot of air”* (E3). *“...the inside of it ... makes a noise ...”* (E9). *“I say to myself ... I've lost my breath*
 22
 23 248 *...”* (E9), *“Well, it's when I heard my lungs that ... that I knew I did not blow well”* (E9).

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26 250 **After spirometry**

27
 28 251 The participants also voiced being apprehensive about getting the results and felt conflicted between
 29
 30 252 wanting to have a diagnosis and being afraid of the diagnosis. Feelings of grief were expressed when
 31
 32 253 asked to recall the moment the spirometry results were announced. These expressions of grief
 33 254 naturally emerged according to the stages described by E. Kubler-Ross[40]:

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 35 255

1. Shock

36 256

“I tell myself it was not good news ...” (E3)

38 257

“Well, the end of consultation... the rest was much less important for me ...” (E3)

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 40 258

41

42 259

2. Denial

43 260

“For me it's not suitable ... it's the system I do not say the device ... it's the system ...”, “well
 44
 45 261 *after I say ... he is kidding”* (E8)

46

47 262

“I thought this was a joke” (E5)

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49 263

50 264

3. Sadness and cognitive saturation:

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“Well, I tell you I felt shame, sadness” (E1)

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54 266

“I was glad when it ended, I think I had had enough for that day, I had heard enough.” (E1)

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57 268

4. Anger and shame

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1
2 269 *“It’s very distressing (tears)... but there is more to this side ... this mortifying side lasts*
3
4 270 *longer” (E1)*
5
6 271 *“If you are told that you have weakness somewhere... it’s a little upsetting” (E2)*
7 272 *“I’m afraid that ... I’ll have cancer” (E10)*
8
9 273 *“Well, it breaks my heart ... I have a friend who died of that because of cigarettes ... a*
10
11 274 *heart attack”(E6)*

12 275
13
14 276 5. Expectation of more information:

15
16 277 *“I think ... I was expecting more explanations ... ” (E7)*
17
18 278 *“I’m thinking ... I’m going to try to smoke less ... ” (E9)*
19 279 *“I’m thinking about stopping smoking...” (E6)*
20
21 280 *“I think I should try to quit” (E10)*
22
23 281 *“I tell myself that I smoke too much” (E9)*

24 282
25
26 283 6. Pain and depression

27
28 284 *“It is like a sentence of the condemned” (E1)*

29
30 285
31 286 7. Rebuilding

32
33 287 *“You know, when you have to go to war... well, it’s a bit similar” (E1)*
34
35 288 *“I can cope with COPD” (E1)*
36
37 289 *“I tell myself she’s right” (E6)*
38 290 *“Well... I feel like I’m starting to realise” (E10)*
39
40 291 *“Now, I can look to the future” (E1)*

41
42 292
43 293 8. The consultation even enabled some participants to accept the disease

44
45 294 *“There’s a kind ... of ... I would call it: acceptance” (E1)*
46
47 295 *“Well, it is a diagnosis that I expected” (E7)*
48
49 296 *“He tells me it’s a ... it’s a chronic bronchitis” (E9)*

50 297
51
52 298 The consultation that follows the spirometry test is also a meaningful part of the patient’s experience.

53
54 299 *“He concludes that I do not have asthma (...) it somehow reassures me” (E3)*
55
56 300 *“I felt a little improvement with his medication ... so what happens to me is that well ... that*
57 301 *reassures me a little bit” (E3)*
58
59
60

Discussion

Summary of findings

Before the spirometry experience the participants were willing but expressed feeling apprehensive about discovering the reason for their ill health. During the spirometry experience, the participants described the spirometry test as being strange, unsettling and painful. After the spirometry experience, the participants also voiced renewed apprehension about the results and felt conflicted between wanting to have a diagnosis and being afraid of the diagnosis.

We observed that these elicited reports of the spirometry experience combined three characteristics of health behavioural change models; importance, opportunity and confidence[41]. Importance refers to the magnitude of the problem for the patient, opportunity refers to the timing to take action and confidence is the self-belief in success. Combining these three behavioural change characteristics motivates people living with a chronic disease to engage in self-management with shared decision-making[42, 43].

Our findings highlight that apart from being a diagnostic tool, spirometry is an important step for participants. In fact, the participative nature of the spirometry test, elicited as a sense of urgency, encourages the patient's drive to become actively involved in their health. This active participation was illustrated by the desire participants expressed to perform well: "*I tried to blow in and hold for as long as possible*" (E1). Spirometry also enabled the participants to confront the state of their own health and their limits. "*I understand*", "*I heard my lungs*", "*I'm not surprised*". These results show that participants understood their lungs were the source of their ill health, unlike other qualitative research studies using thematic analysis, which suggested that patients passively accepted and resigned themselves to their circumstances[11]. When patients actively participate in measuring their physical limits, they gain awareness about the impact of the disease. "*What are we going to find?*" (E10) This shows that the patients understand the importance and magnitude of their disease as described in the motivation interviewing model[44].

We also found that participants expressed this spirometry experience as an opportunity to act. They described the experience as being uncomfortable but resembled the symptoms with which they live daily. These illness perceptions are meaningful as they refer to their own life experience. After spirometry, patients expressed a cognitive intention to stop smoking. "*I should try to quit*" (E10)

1
2 337 Lastly, although the participants expressed feeling strange about the spirometry test and were forced
3
4 338 to struggle with their symptoms, they gained confidence in their ability to manage their health with
5
6 339 the support of their doctor, “*We never know what is in store for us, but ... it's my doctor, I'm confident*”
7 340 (E3). Also, verbatim from the debriefing indicated that participants were confident in their ability to
8
9 341 reduce or even stop smoking, which is an important step in the process of changing behaviour[41].
10

11 342 **Strengths and limitations of the study**

13 343
15 344 To our knowledge, this is the first phenomenological study on spirometry for COPD conducted to
16
17 345 date. Micro-phenomenological analysis from open elicitation interview has been used in the fields of
18
19 346 psychiatry, pedagogy and neuroscience, however few studies have applied this technique in primary
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21 347 care[34].
22 348

24 349 Although this micro-phenomenological-inspired analysis is limited by the qualitative nature of the
25
26 350 study, the open elicitation interview gave us access to participant emotions during spirometry in a
27
28 351 primary setting. Although we were aware that researcher attitudes may have influenced the data
29
30 352 interpretation, investigator triangulation reduced this possibility of bias. Also, by employing an open
31
32 353 elicitation interview, participants were able to retell their experience as they lived it, in their own
33
34 354 words. This decreased the potential for sociability bias and increased the internal consistency.
35

36 356 The time frame explored through the interview was limited to the short period around the spirometry
37
38 357 examination, and some participants had little insight into the spirometry experience. This may account
39
40 358 for the unusually short interview length for a micro-phenomenological approach, which typically lasts
41
42 359 for at least one hour. Other elements surrounding the spirometry experience such as the context of
43
44 360 realisation or the relationship with the health professional involved in the spirometry test experience
45
46 361 could have been further explored.
47

48 363 Although the sample size was small, it was within the recommended limits for the descriptive
49
50 364 phenomenological approach and may have been restricted by the limited use of spirometry in primary
51
52 365 care in France [25, 45].
53 366

55 367 Thus, the experiences the participants reported appear to stimulate the right combination of these
56
57 368 three characteristics of health behavioural change models[41]. This suggests that spirometry can
58
59 369 instigate health behavioural change and may be a key moment for patient empowerment in COPD.
60

1
2 370 Although there have been no other reports of spirometry experience using micro-phenomenology,
3
4 371 our results are consistent with the life history of a COPD patient and may provide a breakthrough
5
6 372 point for change. These findings indicate that a change occurs when people with confirmed COPD
7
8 373 have a spirometry test. These people change from a state where they are willing but apprehensive
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10 374 about the diagnosis, and advance to a state of acceptance. This process is similar to the stages of grief
11
12 375 described by Kubler Ross[46] and corresponds with the step wise processes of the change model
13
14 376 described by Prochaska and Di Clemente[20].

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18 378 The micro-phenomenological inspired approach adopted in this study, enabled us to explore the
19
20 379 participants' emotional experience during spirometry in primary care settings with the empathic
21
22 380 support of their own GP. Our data on perception, cognition and emotion suggest that spirometry
23
24 381 testing may be an optimal time for primary care clinicians to support their patients to make
25
26 382 behavioural changes, such as increasing physical activity or reducing smoking. This reflects similar
27
28 383 accounts where lung function testing is an opportune moment to change patient attitudes toward
29
30 384 smoking cessation[47, 48].

31 385 32 33 386 *Comparison with existing literature and implications clinical practice*

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35 387
36
37 388 The unique choice of combining a micro-phenomenological analysis and an open elicitation
38
39 389 interviewing technique highlighted that spirometry is not only a useful diagnostic tool, but also a tool
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41 390 to empower people with COPD to drive behavioural change. This is consistent with other studies that
42
43 391 have explored the patient experience of a technical act where patients were more concerned with the
44
45 392 attitude of the team and the personal attention they received[45]. Moreover, a recent paper on mobile
46
47 393 health in COPD showed that personalised feedback is needed to engage patients[42]. These results
48
49 394 highlight the various fields involved when patients experience a medical act. This suggests that there
50
51 395 is a need to investigate the patient experience of other technical gestures in primary care to promote
52
53 396 self-confidence in patient self-management, facilitated by a health professional's caring attitude.
54
55 397 Physicians should allow adequate time and listen to patients' stories, and thus develop a shared
56
57 398 understanding of the temporal aspect of the illness and patients' needs and concerns.

58 399 **Conclusions**

59 400
60 401 Although this study is exploratory, our findings suggest that spirometry gives patients with COPD an
61
62 402 opportune support for behaviour change. Spirometry may allow people living with COPD to
63
64 403 recognise their own limitations, adapt their activities to their lung capacity and to modify behaviour.

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2 404 **Author statement**
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4 405

5 406 At the time of data collection:

6 407 M.BREMOND : physiotherapist, Msc

7 408 A.BERTHELOT : general practitioner student

8 409 H.BRETON : Sociologist, PhD

9 410 L.PLANTIER : professor physiologist, PhD

10 411 M.PAUTRAT : senior registrar, general practitioner MD, Msc
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12 412

13 413 Author's contribution :

14 414 M.P. and M.B. conceived the original idea and designed the model

15 415 M.B. and A.B. carried out the experiment, and wrote the manuscript

16 416 H.B. and L.P. helped supervise the project

17 417 M.P. directed the project

18 418 All authors provided critical feedback and helped shape the research analysis on manuscript.
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22 421 **Competing interest**
23 422

24 423 The authors declare that there is no conflict of interest regarding the publication of this article, and
25 424 no financial resources.
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29 427 **Data statement**
30 428

31 429 The full dataset is available from the corresponding author.
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34 431

35 432 **Patient and Public Involvement statement**
36 433

37 434 Neither the patient nor the public were involved in the design, conduct, reporting or dissemination
38 435 plans of our research.
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60**COREQ Checklist**

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist.			
No.	Item	Guide questions/description	Response/page number referenced
Domain 1: Research team and reflectivity			
Personal characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Page 6 (Patient recruitment section): "They were all performed by the same investigator (AB), a MD student of general medicine"
2.	Credentials	What were the researcher's credentials? E.g. PhD, MD	Page 15 (Author statement section): "at the time of data collection : M.BREMOND : physiotherapist, Msc A.BERTHELOT : GP student H.BRETON : Sociologist, PhD L.PLANTIER : physiologist, PhD M.PAUTRAT : senior registrar, GP MD, Msc"
3.	Occupation	What was their occupation at the time of the study?	Page 15 (Author statement section, as above)
4.	Gender	Was the researcher male or female?	Not relevant in the context of this study as would not have affected conduct or analysis of focus groups on pain assessment.
5.	Experience and training	What experience or training did the researcher have?	Page 12 (Discussion section): "All researchers involved in data collection and analysis had conducted and been involved in prior qualitative research studies."
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Not applicable as professional relationships were used as the basis for recruitment (snowballing).
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research.	Page 6-7 (Patient recruitment section): "investigator (AB), a MD student of general medicine without any connection to any of the participants"

			Participants were also given a brief background to the rationale of the study when they signed the informed consent.
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic.	<p>Bias/assumptions reported on Page 12 (Discussion section): “A work of putting in suspension theoretical knowledge, the a priori and the expected answers was carried out on the part of the analyst and a will to be surprised by the results were respected.”</p> <p>Reasons and interest in the topic area reported on Page 4 (Introduction section): “spirometry has yet not been associated with increased motivation for healthy behaviour ”</p>
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	<p>Page 5 (study design section): “A phenomenological analysis inspired by Micro-Phenomenology (MP) approach was used. Micro-phenomenology is a method of descriptive phenomenology inspired by the ‘entretien d'explicitation’ [...] a method of open non-inductive interview ”</p>
Participant selection			
10.	Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	<p>Page 5-6 (Patient recruitment section): “ Patients were recruited by the snowball effect in several rural or urban general practices ”</p>

11.	Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 6 (Patient recruitment section): “ They were approached by AB by phone after their GP told them about the study”
12.	Sample size	How many participants were in the study?	Page 8 (Results section): Ten people agreed to participate and were interviewed
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	Not applicable- All who registered interest took part in the interviews.
Setting			
14.	Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 6 (Patient recruitment section):
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	Not applicable- no other persons present during conduct of interviews.
16.	Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 8-9 (Result section)
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Not applicable as no specific interview guide
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	Not applicable - interviews are not repeated.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 6 (Patient recruitment section): “The interviews were recorded, transcribed verbatim, and anonymized.”
20.	Field notes	Were field notes made	Page 6 (Patient recruitment section):

		during and/or after the interview or focus group?	“Field notes collected by the researchers during the conduct of interviews were used to provide additional context to the analytical process.”
21.	Duration	What was the duration of the interviews or focus group?	Page 8 (Results section): mean duration of 27.15mins (range 20-37 mins).
22.	Data saturation	Was data saturation discussed?	Not applicable as not an aim of this micro-phenomenological approach.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not applicable as transcripts were not returned to participants.
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Page 6 (Patient recruitment section): “ This descriptive phenomenological analysis has been carried out by all the researchers following the process described in the literature.”
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Not applicable for this micro-phenomenological approach.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Page 8-9 (Results section): Coders not defined what would be considered a significant theme prior to data analysis but for clarity "The results were presented chronologically from before spirometry, during spirometry, and after spirometry. ”.
27.	Software	What software, if applicable, was used to manage the data?	No specific software was used, only Excel to help with classification
28.	Participant checking	Did participants provide feedback on the findings?	Not applicable as participants did not provide feedback on the data/findings.
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number.	Page 8-11 (Results section): Quotations are presented throughout the text alongside interpretations.
30.	Data and findings consistent	Was there consistency between the data presented and the	Page 8-11 (Results section): Quotations are presented alongside interpretations for transparency between data and

		findings?	findings.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Page 8-11 (Results section): the results have been presented chronologically and the most symbolic quotations have been organised in this chronology
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	The micro-phenomenological approach does not make it possible to list certain major or minor themes in the results. The discussion gives meaning to the most significant quotations

BMJ Open

A micro-phenomenological approach to explore the patient experience during an initial spirometry examination to diagnose COPD in general practice in France

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4 2 **spirometry examination to diagnose COPD in general practice in France**
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30 **Abstract**

31 **Objectives:** To explore the patient experience of a spirometry test used to confirm COPD diagnosis
32 in patients with suspected smoking-related COPD.

33 **Design:** This is a qualitative study, performed with open interviews in adults following a routine
34 spirometry test to confirm COPD diagnosis. Data were analysed with a phenomenological-inspired
35 micro-phenomenology approach.

36
37 **Participants:** Eligible patients were recruited through their general practitioner, ten were
38 interviewed.

39
40 **Setting:** Primary care in Centre-Val-De-Loire area, France, in 2018.

41 **Results:** Participants reported the spirometry test experience as being unfamiliar but gave meaning
42 to the symptoms they experience. Participants expressed a desire to perform the test well and a
43 willingness to confront their state of health. After the spirometry had been completed and the results
44 announced, participants moved through stages of grief from their pre-spirometry self and symptom
45 perception to a state of acceptance. Overall, participants expressed a narrative of an evolving
46 cognitive and corporeal awareness during this spirometry experience. The verbatims describe a
47 cognitive rupture with their chronic illness usually considered as a “way of life”.

48 **Conclusions:** A spirometry test goes beyond a diagnostic value, providing patients with an
49 opportunity to gain awareness of their own state of health, re-frame their breathlessness-related
50 limitations and thus begin to accept the disease. These awareness gains may be considered as small
51 steps towards health behavioural change. Spirometry may have educative potential and support
52 lifestyle changes.

53
54 **Keywords:** *Spirometry; COPD; Primary care; Descriptive phenomenology analysis; Micro-*
55 *phenomenology*

Strengths and limitations of this study

- To avoid subjective bias, the researchers coded the verbatim separately and then cross-checked their findings.
- This interview method allows participants to express themselves freely about their real-life experience: thus, it decreases the risk of sociability bias and increases the internal consistency.
- The use of spirometry is not widespread in primary care in France, which may account for the small number of participants.
- The elicitation interview method may have been limited in this specific population due to participant low level of insight into the procedure. This may account for the unusually short interview length compared with the descriptive phenomenological approach.

1 2 71 **Introduction**

3
4 72 Chronic Obstructive Pulmonary Disease (COPD) is currently the third leading cause of death in the
5
6 73 world, and in France, an estimated 3.5 million people are affected. The annual social cost is €3.5
7
8 74 billion and mortality is 16,000 patients per year[1, 2] This burden made COPD a public health priority
9
10 75 topic in 2018[3].

11
12 76 COPD is a complex, systemic disease that progresses slowly and insidiously, gradually reducing
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14 77 physical activity levels. Phenomenological studies suggest that COPD involves physical, social,
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16 78 psychological and emotional components, meaning patients adapt their lifestyle to their respiratory
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18 79 status over time[4-6]. This adaptive strategy draws people living with COPD into a downward spiral
19
20 80 of physical and psychosocial deconditioning that greatly impacts their quality of life[7]. Also, the
21
22 81 slow disease progression enables many patients to avoid accepting their declining health and eventual
23
24 82 mortality[8]. Although some people with COPD engage coping strategies, many do not and instead,
25
26 83 become psychologically and emotionally distressed, continuing to deny their ill health[9]. Most
27
28 84 patients express “accepting” COPD as a “way of life”[10]. Using this acceptance strategy means that
29
30 85 people adapt their daily living activities to their reducing breathing capacities. However, this strategy
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32 86 reinforces the denial coping mechanism, preventing patients from becoming aware of their disease
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34 87 and identifying opportunities [4, 11-13] which may slow down further deterioration of their condition.
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36 88 For an individual to become aware that their feeling of being ill is a disease, they require a clear
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38 89 diagnosis. Understanding the diagnosis allows individuals to accept the symptoms and act to slow the
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40 90 progression associated with COPD[14, 15]. Breaking with denial and recognising personal limitations
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42 91 related to their symptoms forces patients to deal with the illness[6, 16].

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44 92 Disease acceptance is the first step towards engaging patients to manage their breathlessness[17].
45
46 93 When patients are empowered to manage their health, they experience fewer exacerbations, adhere
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48 94 better to medication and have better quality of life[17-19]. Some health behavioural change models
49
50 95 examine patient experience as part of the decision-making process with an identified tipping point of
51
52 96 opportunity for change[20]. One tipping point for patients with a chronic condition is the minimum
53
54 97 belief needed in order to make changes that improve their quality of life. For example, the importance
55
56 98 of the problem in the patient’s life, the level of opportunity in their lifetime to take action, and self-
57
58 99 confidence in their ability to achieve this change.

59
60 100 Spirometry is required to diagnosis COPD. When COPD is diagnosed early, patients report fewer
61
62 101 exacerbations compared to undiagnosed patients[21, 22]. Thus, using spirometry for early COPD
63
64 102 diagnosis is justified in primary care[23-25]. Although the validity and feasibility of spirometry for

1
2 103 COPD diagnosis have been shown in primary care[26, 27], its use is suboptimal in France, requiring
3
4 104 a motivated clinician [28-30] and patient collaboration to correctly perform the forced exhalation
5
6 105 manoeuvre.
7

8 106 Little is known about the effect the first spirometry test has on raising patient awareness about their
9
10 107 symptoms in primary care. Although concepts such as “Lung Age” have been used to foster smoking
11
12 108 cessation[31], spirometry has yet to be shown to motivate patients to change their behaviour and
13
14 109 accept their diagnosis. These techniques may be useful for a stepwise improvement in the delivery of
15 110 care to patients with chronic respiratory conditions.
16
17

18 111 The aim of this study was to explore the patient experience following a spirometry test in primary
19
20 112 care to determine if this experience could meet criteria for health behavioural change.
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26 114 **Methods**

27 115 *Study design*

28 116 The phenomenological interview

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31 118
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33 119 Micro-phenomenology is a novel analytic technique to measure the introspective, personal view of
34
35 120 an experience by exploring visual, emotional and auditive experiences around the reference event
36
37 121 [32-34]. This approach was inspired by the more complex phenomenological approach, which
38 122 challenges the concept of disease, whereby signs and symptoms are mediated by cultural ideas of
39
40 123 illness.[35] The interview technique was inspired by an explanatory interview developed by the
41
42 124 French psychologist Pierre Vermersch. Using this technique to elicit the patient experience, the
43
44 125 interviewer evokes a past experience within the interviewee, who in turn re-enacts the experience
45 126 during an open interview. This technique allows researchers to explore the reference event from the
46
47 127 pre-reflected consciousness (implicit) to the thoughtful consciousness (explicit)[36]. This micro-
48
49 128 phenomenology technique has previously been shown to evoke experiences commonly encountered
50 129 in primary care, such as acute onset of pain in chronic pain diseases[37].
51
52 130

53 131 *Participants*

54 132
55 133 Ten adults who had spirometry-confirmed, smoking-related COPD, participated in this study of which,
56
57 134 six were male and four were female, aged between 40 to 76 years (mean 59). The mean age was 59
58
59 135 years, range (40 -76) and lung function (mean FEV1) was 62% (range: 35-85%). Seven were active
60

1
2 136 smokers and three were ex-smokers and a smoking history that ranged from 10 to 40 pack-years (mean
3
4 137 26). Participants were excluded if they had a history of asthma, advanced heart failure, pre-existing
5
6 138 COPD diagnosis, did not speak French or had dementia. The snowball sampling method was used to
7
8 139 ensure a diverse selection of patient characteristics were obtained: age, gender, socio-economic status.
9
10 140 Six participants lived in a rural environment, four had retired, five were in current employment and
11 141 one was unemployed. Among those with current or previous employment, six were manual workers,
12
13 142 three were office-based workers and one was a health professional. All but three participants were
14
15 143 being treated with inhaled therapy for their respiratory symptoms.

16 17 144 *Patient recruitment*

18
19
20 145 Patients with suspected COPD were recruited by general practitioners (GPs) in two rural and one
21
22 146 urban general practice in the Centre-Val-de-Loire region of France. All GPs were experienced with
23
24 147 spirometry and were practicing in multidisciplinary care centres. Once a general practitioner had
25
26 148 informed an eligible participant about the study, the researcher (AB) approached them by telephone.
27 149 All interested participants took part in the interviews.

28 29 30 150 *Study procedure and data collection*

31
32
33 151 The research team, (MB, AB and MP) developed an open interview guide with phenomenological
34
35 152 prompts and probes focused on the spirometry test experience. A pilot test was unnecessary for an
36
37 153 open interview. Patients were not asked to explain or make sense of the reference event. Speech
38 154 authenticity was respected, and follow-up prompts were intended only to encourage participants to
39
40 155 recount their personal experience. Data saturation was not required for this micro-phenomenological
41
42 156 approach as the objective was to identify and understand shared features in this lived experience.
43 157 Thus, a sample size of 10 patients was considered sufficient to elicit common structures.

44
45
46 158 The interviews were conducted up to 3 months after the spirometry test was performed and took place
47
48 159 in the patient's usual primary care setting. The investigator (AB) introduced himself as a medical
49
50 160 student specialised in general practice. He had no previous connection with the participants. After
51
52 161 providing their consent to participate in the study, participants were asked to describe their thoughts
53 162 at three specific time points: before spirometry, at the time of spirometry and at the announcement of
54
55 163 results. The interviews were performed once and recorded with a mobile phone, the verbatim
56
57 164 transcribed, anonymised and labelled. Additional field notes were made during the interviews and
58
59 165 included in the analysis. The participants were given the opportunity to stop at any time and were
60 166 informed that their responses and personal information would remain anonymous. No time limit was

1
2 167 expected for the interview apart from the defined timepoints. The interview was structured according
3
4 168 to P. Vermersch[36].
5

6 169 ***Reliability criteria***

8
9
10 170 The investigator AB was trained in micro-phenomenological technique and all researchers involved
11 171 in data collection and analysis had previous experience in conducting qualitative research studies.
12

13
14 172 To avoid subjective influence, investigators remained impartial, laying aside theoretical knowledge,
15
16 173 *a priori* and the expected answers. Analysts remained impartial and willing to be surprised by the
17
18 174 results.
19

20 175 21 176 ***Ethical considerations***

22
23
24 177 All participants signed informed consent forms and all audio recordings were destroyed after
25
26 178 transcription and anonymisation. Ethics committee approval was obtained by the local ethical review
27
28 179 board (Comité central de réflexion éthique, No. 2017 047). The study was conducted in accordance
29 180 with all French regulations.
30
31

32 181 33 182 ***Data analysis***

34
35 183 The analysis was performed in accordance with the process described by Valenzuela-Moguillansky
36
37 184 et al[38]. The coding framework consisted of six steps as outlined in Table 1 Before data analysis,
38
39 185 investigator triangulation was performed to obtain a comprehensive picture. The results *a priori* were
40
41 186 elucidated from four investigators, two general practitioners, one physiotherapist and one narrative
42
43 187 medicine specialist. The investigators used an iterative process and were careful to allow the themes
44
45 188 to emerge from the data. After consensual discussion among investigators these data were converged
46
47 189 and grouped into three categories, according to the description criteria for experience in the
48
49 190 phenomenological approach (cognitive, perception and feeling) [39]. These three categories provide
50
51 191 a conceptual framework in which patients make health behavioural changes.
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2 195 **Table 1:** The six steps of coding framework

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Steps	OBJECTIFS
Step 1: listen, read and reread the interview	Data immersion and entry into the participant's world (comprehensive approach)
Step 2: initial annotations	Produce a set of comprehensive and detailed notes and comments on the data considering the semantic content of the speech as well as the language used by the participant
Step 3: Develop emerging themes	Produce themes reflecting both the participant's discourse and the analyst's active interpretation process
Step 4: Identify links between emerging themes	Produce a structure capable of reflecting the most interesting and important aspects of the participant's story by grouping and linking the themes produced in the previous step
Step 5 and 6: move on to the next case and search for links between the interviews	Apply steps 1 to 4 on a new interview then search for links between the different interviews selected for analysis

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Results

Ten people agreed to participate and were interviewed. The interviews were carried out between 26/07/2017 and 18/03/2018 with a mean duration of 27.15mins (range 20-37 mins). The transcripts were numbered EX – EY and the emergent categories are presented here in chronological order before, during and after the spirometry text experience. To illustrate the context for the reported

1
2 203 experiences, the emergent categories derived from the data are presented chronologically; before
3
4 204 during and after spirometry, in the present tense, including only meaningful words.
5

6 7 205 **Before spirometry**

8 206
9
10 207 Before their first spirometry, the participants described feeling as if they were getting involved in a
11
12 208 mysterious experiment. Although willing, they felt apprehensive about discovering the reason for
13
14 209 their ill health. *"There's a moment you have to...dot the i's and cross the t's, see what happens, so
15 210 here we go...let's go"* (E1). Discovering the device was a new, unusual experience for these patients
16
17 211 *"I was not used to doing this ... these tests ..."* (E3), *"...because I did not know that stuff"* (E8). For
18
19 212 some, having confidence in their doctor made the feeling of uncertainty for the future diagnosis more
20
21 213 bearable. *"...after all, we never know what is in store for us, ... so we look everywhere but ... it's my
22 214 doctor, I'm confident ..."* (E7). Patients also reported feeling apprehensive about breathing into the
23
24 215 device. *"Then suddenly I was told: 'Ok, we will have you blow in the machine'"*(E1). *"In fact, it's
25 216 super scary!; I say to myself I hope it's okay ... I'm not going to be too sick ..."* (E9). *"We know but
27 217 we do not want to know; we have strong doubts"* (E1). Patients also experienced somatic symptoms
28
29 218 of stress before breathing into the device. *"I'm starting to stress"* (E10), *"my heart is beating at 150"*
30
31 219 *(E1). "I had the feeling my whole body was tense"* (E1). *"Few sweats and knots in the stomach"*
32
33 220 *(E9). "My stomach is tying itself in knots and I say to myself, 'this is happening .. well, what are we
34 221 going to find?'"* (E10). Patients also expressed feeling stressed about the expected outcome of the
35
36 222 examination. *"We know, but we don't want to know; we have strong doubts"* (E1). *"I tell myself: 'I
37 223 hope it's okay ... I mean ... I'm not going to be too sick' ..."* (E10).
39 224
40 225

41 226 **During spirometry**

42
43 227 The participants described the spirometry test as being strange, unsettling and painful. The emergent
44
45 228 lexical field portrayed the spirometer as discovering a new and unimportant object. *"It is a tool"* (E3),
46
47 229 *"...he makes me blow in the, I don't know what..."* (E4), *"I blow again in the thing."* (E4). As an
48
49 230 appropriation strategy, some patients give the device a nickname. *"I call it a toy ... precisely which
50 231 are design to do the test...to blow in ... in the trumpet ..."* (E8).
51
52 232

53
54 233 The participants described the forced expiratory manoeuvre as an uncomfortable experience. *"This
55 234 horrible thing really tried me."* (E8) *"It makes me cough like an animal."* (E4) *"It's too big for me."*
56
57 235 *(E4). "I felt like there was no resistance ...in the device"* (E2). Some even described the manoeuvre
58
59 236 as being painful to exhale so strongly. *"It hurts my head to have blown like that..."*,(E5). *"It makes
60*

1
 2 237 *my head turn...*” (E7). Nevertheless, patients were engaged and motivated to achieve the best result
 3
 4 238 possible. *“I tried to blow out and hold as long as possible ...”* (E2) *“I think I've reached the end.”*
 5 239 (E5) *“I have no more oxygen in my ... in my lungs”* (E6). *“I'm empty...”* (E3). *“I breathe until I feel*
 6
 7 240 *that I can't breathe any more”* (E3). Some felt a desire or an anxiousness to perform well. *“I feel like*
 8
 9 241 *I'm not good at blowing”* (E2), *“As long as I stand tall... well in the rank, and the results are good,*
 10
 11 242 *that's fine ”* (E5).

12 243
 13
 14 244 Participants expressed having a heightened awareness about their health status.

15
 16 245 The participants voiced that spirometry made them conscious that there was a problem with their
 17
 18 246 health. *“I understand it ... since I felt it ...”* (E3). *“I'm not surprised ...”* (E7). *“It affects you”* (E1).
 19 247 Furthermore, they expressed a realisation of their limitations. *“By the finding, I had trouble expelling*
 20
 21 248 *a lot of air”* (E3). *“...the inside of it ... makes a noise ...”* (E9). *“I say to myself ... I've lost my breath*
 22
 23 249 *...”* (E9), *“Well, it's when I heard my lungs that ... that I knew I did not blow well”* (E9).

24 250 25 26 251 **After spirometry**

27
 28 252 The participants also voiced being apprehensive about getting the results and felt conflicted between
 29
 30 253 wanting to have a diagnosis and being afraid of the diagnosis. Feelings of grief were expressed when
 31
 32 254 asked to recall the moment the spirometry results were announced. These expressions of grief
 33 255 naturally emerged according to the stages described by E. Kubler-Ross[40]:

34 35 256 1. Shock

36
 37 257 *“I tell myself it was not good news ...”* (E3)

38 258 *“Well, the end of consultation... the rest was much less important for me ...”* (E3)

39 40 259 41 42 260 2. Denial

43 261 *“For me it's not suitable ... it's the system I do not say the device ... it's the system ...”, “well*
 44
 45 262 *after I say ... he is kidding”* (E8)

46
 47 263 *“I thought this was a joke”* (E5)

48 49 264 50 265 3. Sadness and cognitive saturation:

51
 52 266 *“Well, I tell you I felt shame, sadness”* (E1)

53
 54 267 *“I was glad when it ended, I think I had had enough for that day, I had heard enough.”* (E1)

1
2 271 4. Anger and shame

3
4 272 *“It’s very distressing (tears)... but there is more to this side ... this mortifying side lasts*
5 273 *longer” (E1)*

6
7 274 *“If you are told that you have weakness somewhere... it’s a little upsetting” (E2)*

8
9 275 *“I’m afraid that ... I’ll have cancer” (E10)*

10
11 276 *“Well, it breaks my heart ... I have a friend who died of that because of cigarettes ... a*
12 277 *heart attack”(E6)*

13
14 278
15
16 279 5. Expectation of more information:

17 280 *“I think ... I was expecting more explanations ... ” (E7)*

18 281 *“I’m thinking ... I’m going to try to smoke less ... ” (E9)*

19 282 *“I’m thinking about stopping smoking...” (E6)*

20
21 283 *“I think I should try to quit” (E10)*

22
23 284 *“I tell myself that I smoke too much” (E9)*

24
25 285
26
27
28 286 6. Pain and depression

29 287 *“It is like a sentence of the condemned” (E1)*

30 288
31
32
33 289 7. Rebuilding

34 290 *“You know, when you have to go to war... well, it’s a bit similar” (E1)*

35 291 *“I can cope with COPD” (E1)*

36 292 *“I tell myself she’s right” (E6)*

37 293 *“Well... I feel like I’m starting to realise” (E10)*

38 294 *“Now, I can look to the future” (E1)*

39 295
40
41
42
43 296 8. The consultation even enabled some participants to accept the disease

44 297 *“There’s a kind ... of ... I would call it: acceptance” (E1)*

45 298 *“Well, it is a diagnosis that I expected” (E7)*

46 299 *“He tells me it’s a ... it’s a chronic bronchitis” (E9)*

47 300
48
49
50 301 The consultation that follows the spirometry test is also a meaningful part of the patient’s experience.

51 302 *“He concludes that I do not have asthma (...) it somehow reassures me” (E3)*

52 303 *“I felt a little improvement with his medication ... so what happens to me is that well ... that*
53 304 *reassures me a little bit” (E3)*

Discussion

Summary of findings

Before the spirometry experience the participants were willing but expressed feeling apprehensive about discovering the reason for their ill health. During the spirometry experience, the participants described the spirometry test as being strange, unsettling and painful. After the spirometry experience, the participants also voiced renewed apprehension about the results and felt conflicted between wanting to have a diagnosis and being afraid of the diagnosis.

We observed that these elicited reports of the spirometry experience combined three characteristics of health behavioural change models; importance, opportunity and confidence[41]. Importance refers to the magnitude of the problem for the patient, opportunity refers to the timing to take action and confidence is the self-belief in success. Combining these three behavioural change characteristics motivates people living with a chronic disease to engage in self-management with shared decision-making[42, 43].

Our findings highlight that apart from being a diagnostic tool, spirometry is an important step for participants. In fact, the participative nature of the spirometry test, elicited as a sense of urgency, encourages the patient's drive to become actively involved in their health. This active participation was illustrated by the desire participants expressed to perform well: "*I tried to blow in and hold for as long as possible*" (E1). Spirometry also enabled the participants to confront the state of their own health and their limits. "*I understand*", "*I heard my lungs*", "*I'm not surprised*". These results show that participants understood their lungs were the source of their ill health, unlike other qualitative research studies using thematic analysis, which suggested that patients passively accepted and resigned themselves to their circumstances[11]. When patients actively participate in measuring their physical limits, they gain awareness about the impact of the disease. "*What are we going to find?*" (E10) This shows that the patients understand the importance and magnitude of their disease as described in the motivation interviewing model[44].

We also found that participants expressed this spirometry experience as an opportunity to act. They described the experience as being uncomfortable but resembled the symptoms with which they live daily. These illness perceptions are meaningful as they refer to their own life experience. After spirometry, patients expressed a cognitive intention to stop smoking. "*I should try to quit*" (E10)

1
2 340 Lastly, although the participants expressed feeling strange about the spirometry test and were forced
3
4 341 to struggle with their symptoms, they gained confidence in their ability to manage their health with
5
6 342 the support of their doctor, “*We never know what is in store for us, but ... it's my doctor, I'm confident*”
7 343 (E3). Also, verbatim from the debriefing indicated that participants were confident in their ability to
8
9 344 reduce or even stop smoking, which is an important step in the process of changing behaviour[41].
10

11 345 **Strengths and limitations of the study**

12 346
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14 347
15 348 To our knowledge, this is the first phenomenological study on spirometry for COPD conducted to
16
17 349 date. Micro-phenomenological analysis from open elicitation interview has been used in the fields of
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19 350 psychiatry, pedagogy and neuroscience, however few studies have applied this technique in primary
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21 351 care[34].
22

23
24 352 Although this micro-phenomenological-inspired analysis is limited by the qualitative nature of the
25
26 353 study, the open elicitation interview gave us access to participant emotions during spirometry in a
27
28 354 primary setting. Although we were aware that researcher attitudes may have influenced the data
29
30 355 interpretation, investigator triangulation reduced this possibility of bias. Also, by employing an open
31
32 356 elicitation interview, participants were able to retell their experience as they lived it, in their own
33
34 357 words. This decreased the potential for sociability bias and increased the internal consistency.
35

36 358
37 359 The time frame explored through the interview was limited to the short period around the spirometry
38
39 360 examination, and some participants had little insight into the spirometry experience. This may account
40
41 361 for the unusually short interview length for a micro-phenomenological approach, which typically lasts
42
43 362 for at least one hour. Other elements surrounding the spirometry experience such as the context of
44
45 363 realisation or the relationship with the health professional involved in the spirometry test experience
46
47 364 could have been further explored.
48

49 365
50 366 Although the sample size was small, it was within the recommended limits for the descriptive
51
52 367 phenomenological approach and may have been restricted by the limited use of spirometry in primary
53
54 368 care in France [25, 45].
55

56 369
57 370 Thus, the experiences the participants reported appear to stimulate the right combination of these
58
59 371 three characteristics of health behavioural change models[41]. This suggests that spirometry can
60
372 instigate health behavioural change and may be a key moment for patient empowerment in COPD.

1
2 373 Although there have been no other reports of spirometry experience using micro-phenomenology,
3
4 374 our results are consistent with the life history of a COPD patient and may provide a breakthrough
5
6 375 point for change. These findings indicate that a change occurs when people with confirmed COPD
7
8 376 have a spirometry test. These people change from a state where they are willing but apprehensive
9
10 377 about the diagnosis, and advance to a state of acceptance. This process is similar to the stages of grief
11
12 378 described by Kubler Ross[46] and corresponds with the step wise processes of the change model
13
14 379 described by Prochaska and Di Clemente[20].

15
16 380
17 381 The micro-phenomenological inspired approach adopted in this study, enabled us to explore the
18
19 382 participants' emotional experience during spirometry in primary care settings with the empathic
20
21 383 support of their own GP. Our data on perception, cognition and emotion suggest that spirometry
22
23 384 testing may be an optimal time for primary care clinicians to support their patients to make
24
25 385 behavioural changes, such as increasing physical activity or reducing smoking. This reflects similar
26
27 386 accounts where lung function testing is an opportune moment to change patient attitudes toward
28
29 387 smoking cessation[47, 48].

30 388 31 389 *Comparison with existing literature and implications clinical practice*

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33 390
34 391 The unique choice of combining a micro-phenomenological analysis and an open elicitation
35
36 392 interviewing technique highlighted that spirometry is not only a useful diagnostic tool, but also a tool
37
38 393 to empower people with COPD to drive behavioural change. This is consistent with other studies that
39
40 394 have explored the patient experience of a technical act where patients were more concerned with the
41
42 395 attitude of the team and the personal attention they received[45]. Moreover, a recent paper on mobile
43
44 396 health in COPD showed that personalised feedback is needed to engage patients[42]. These results
45
46 397 highlight the various fields involved when patients experience a medical act. This suggests that there
47
48 398 is a need to investigate the patient experience of other technical gestures in primary care to promote
49
50 399 self-confidence in patient self-management, facilitated by a health professional's caring attitude.
51
52 400 Physicians should allow adequate time and listen to patients' stories, and thus develop a shared
53
54 401 understanding of the temporal aspect of the illness and patients' needs and concerns.

53 402 **Conclusions**

55 403
56
57 404 Although this study is exploratory, our findings suggest that spirometry gives patients with COPD an
58
59 405 opportune support for behaviour change. Spirometry may allow people living with COPD to
60
61 406 recognise their own limitations, adapt their activities to their lung capacity and to modify behaviour.

1
2 407 **Author statement**
3
4 408

5 409 At the time of data collection:

6 410 M.BREMOND : physiotherapist, Msc

7 411 A.BERTHELOT : general practitioner student

8 412 H.BRETON : Sociologist, PhD

9 413 L.PLANTIER : professor physiologist, PhD

10 414 M.PAUTRAT : senior registrar, general practitioner MD, Msc
11 415

12 416 Author's contribution :

13 417 M.P. and M.B. conceived the original idea and designed the model

14 418 M.B. and A.B. carried out the experiment, and wrote the manuscript

15 419 H.B. and L.P. helped supervise the project

16 420 M.P. directed the project

17 421 All authors provided critical feedback and helped shape the research analysis on manuscript.
18 422
19 423

20 424 **Data statement**
21 425

22 426 The full dataset is available from the corresponding author.
23 427
24 428

25 429 **Patient and Public Involvement statement**
26 430

27 431 Neither the patient nor the public were involved in the design, conduct, reporting or dissemination
28 432 plans of our research.
29 433

30 434 **Competing Interest**
31 435

32 436 The authors declare that they have no conflict of interests.
33 437

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60**COREQ Checklist**

Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist.			
No.	Item	Guide questions/description	Response/page number referenced
Domain 1: Research team and reflectivity			
Personal characteristics			
1.	Interviewer/facilitator	Which author/s conducted the interview or focus group?	Page 6 (Patient recruitment section): “They were all performed by the same investigator (AB), a MD student of general medicine”
2.	Credentials	What were the researcher’s credentials? E.g. PhD, MD	Page 15 (Author statement section): “at the time of data collection : M.BREMOND : physiotherapist, Msc A.BERTHELOT : GP student H.BRETON : Sociologist, PhD L.PLANTIER : physiologist, PhD M.PAUTRAT : senior registrar, GP MD, Msc”
3.	Occupation	What was their occupation at the time of the study?	Page 15 (Author statement section, as above)
4.	Gender	Was the researcher male or female?	Not relevant in the context of this study as would not have affected conduct or analysis of focus groups on pain assessment.
5.	Experience and training	What experience or training did the researcher have?	Page 12 (Discussion section): “All researchers involved in data collection and analysis had conducted and been involved in prior qualitative research studies.”
Relationship with participants			
6.	Relationship established	Was a relationship established prior to study commencement?	Not applicable as professional relationships were used as the basis for recruitment (snowballing).
7.	Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research.	Page 6-7 (Patient recruitment section): “investigator (AB), a MD student of general medicine without any connection to any of the participants”

			Participants were also given a brief background to the rationale of the study when they signed the informed consent.
8.	Interviewer characteristics	What characteristics were reported about the interviewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic.	<p>Bias/assumptions reported on Page 12 (Discussion section): “A work of putting in suspension theoretical knowledge, the a priori and the expected answers was carried out on the part of the analyst and a will to be surprised by the results were respected.”</p> <p>Reasons and interest in the topic area reported on Page 4 (Introduction section): “spirometry has yet not been associated with increased motivation for healthy behaviour ”</p>
Domain 2: study design			
Theoretical framework			
9.	Methodological orientation and theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	<p>Page 5 (study design section): “A phenomenological analysis inspired by Micro-Phenomenology (MP) approach was used. Micro-phenomenology is a method of descriptive phenomenology inspired by the ‘entretien d'explicitation’ [...] a method of open non-inductive interview ”</p>
Participant selection			
10.	Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	<p>Page 5-6 (Patient recruitment section): “ Patients were recruited by the snowball effect in several rural or urban general practices ”</p>

11.	Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Page 6 (Patient recruitment section): “ They were approached by AB by phone after their GP told them about the study”
12.	Sample size	How many participants were in the study?	Page 8 (Results section): Ten people agreed to participate and were interviewed
13.	Non-participation	How many people refused to participate or dropped out? Reasons?	Not applicable- All who registered interest took part in the interviews.
Setting			
14.	Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Page 6 (Patient recruitment section):
15.	Presence of non-participants	Was anyone else present besides the participants and researchers?	Not applicable- no other persons present during conduct of interviews.
16.	Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Page 8-9 (Result section)
Data collection			
17.	Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Not applicable as no specific interview guide
18.	Repeat interviews	Were repeat interviews carried out? If yes, how many?	Not applicable - interviews are not repeated.
19.	Audio/visual recording	Did the research use audio or visual recording to collect the data?	Page 6 (Patient recruitment section): “The interviews were recorded, transcribed verbatim, and anonymized.”
20.	Field notes	Were field notes made	Page 6 (Patient recruitment section):

		during and/or after the interview or focus group?	“Field notes collected by the researchers during the conduct of interviews were used to provide additional context to the analytical process.”
21.	Duration	What was the duration of the interviews or focus group?	Page 8 (Results section): mean duration of 27.15mins (range 20-37 mins).
22.	Data saturation	Was data saturation discussed?	Not applicable as not an aim of this micro-phenomenological approach.
23.	Transcripts returned	Were transcripts returned to participants for comment and/or correction?	Not applicable as transcripts were not returned to participants.
Domain 3: analysis and findings			
Data analysis			
24.	Number of data coders	How many data coders coded the data?	Page 6 (Patient recruitment section): “ This descriptive phenomenological analysis has been carried out by all the researchers following the process described in the literature.”
25.	Description of the coding tree	Did authors provide a description of the coding tree?	Not applicable for this micro-phenomenological approach.
26.	Derivation of themes	Were themes identified in advance or derived from the data?	Page 8-9 (Results section): Coders not defined what would be considered a significant theme prior to data analysis but for clarity “The results were presented chronologically from before spirometry, during spirometry, and after spirometry. ”.
27.	Software	What software, if applicable, was used to manage the data?	No specific software was used, only Excel to help with classification
28.	Participant checking	Did participants provide feedback on the findings?	Not applicable as participants did not provide feedback on the data/findings.
Reporting			
29.	Quotations presented	Were participant quotations presented to illustrate the themes / findings? Was each quotation identified? e.g. participant number.	Page 8-11 (Results section): Quotations are presented throughout the text alongside interpretations.
30.	Data and findings consistent	Was there consistency between the data presented and the	Page 8-11 (Results section): Quotations are presented alongside interpretations for transparency between data and

		findings?	findings.
31.	Clarity of major themes	Were major themes clearly presented in the findings?	Page 8-11 (Results section): the results have been presented chronologically and the most symbolic quotations have been organised in this chronology
32.	Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	The micro-phenomenological approach does not make it possible to list certain major or minor themes in the results. The discussion gives meaning to the most significant quotations