

ONLINE DATA SUPPLEMENT

The EQ-5D-5L in Chronic Obstructive Pulmonary Disease

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Methods

The EQ-5D-5L self-report questionnaire

The EQ-5D-5L self-report questionnaire comprised two components: the EQ-5D-5L descriptive system and the EQ Visual Analogue Scale (EQ-VAS). The descriptive system consists of five dimensions (mobility, self-care, usual activities, pain/discomfort, anxiety/depression). Participants are asked to indicate their health status by marking the box against the most appropriate of five statements (ranging from 1: “no problems” to 5: “unable to/extreme problems”) for each of the five dimensions. The responses were combined to produce a five-digit number describing the participant’s health status, eg. “11111” indicating no problems with any of the dimensions; “55555” indicating extreme problems with every dimension. This five-digit number was subsequently converted to a Utility Index based on the EQ-5D-5L value set for England (1) (Supplementary Figure 1), ranging from -0.208 (worst possible health) to 1.000 (best possible health). For the EQ-VAS, participants were asked to record their self-rated health on a vertical, visual analogue scale with the endpoints “The worst health you can imagine” and “The best health you can imagine” at the bottom (“0”) and top of the scale (“100”) respectively. Hence an improvement in health related quality of life is associated with an increase in Utility Index and EQ-VAS.

Disease-specific Health related Quality of Life Questionnaires

The scoring of the CAT, SGRQ, CRQ and CCQ has been previously described (2, 3). The CAT was reported as a single score (range: 0 to 40),(2) the SGRQ was reported as individual domain (symptoms, activity, impact (range: 0 to 100) and total scores (range: 0 to 100)(4)

and the CCQ was reported as individual domain (symptoms, function and mental (range: 0 to 6) and total scores (range: 0 to 6)).(3) For these three questionnaires, a higher score equates to worse HRQoL. The CRQ was expressed as individual domain (dyspnoea (range: 5 to 35), fatigue (range: 4 to 28), emotion (range: 7 to 49), mastery (range: 4 to 28) and total summed scores (range: 20 to 140), with higher scores equating to better HRQoL.(5)

Calculating Minimum Important Difference (MID)

We used half the standard deviation (0.5SD) as the distribution-based method (6). Previously, the value of 0.5SD has been shown to correspond with the MID across a variety of studies; furthermore 0.5SD is equivalent to the standard error of measurement for a reliability of 0.75.(6) For anchor-based estimation of MID, we established minimum *a priori* criteria for determining the validity of external anchors, namely a statistically significant correlation between change in EQ-5D-5L and change in anchor, with a correlation coefficient >0.3 as previously recommended.(7) For the Global Rating of Change anchor, we calculated the mean (95% CI) change in EQ-5D-5L with pulmonary rehabilitation in those reporting feeling “a little better” as described by Kon et al.(8)

Linear regression analysis was used to estimate change in EQ-5D-5L corresponding to the established MID for the anchor questionnaire as previously described.(8) For the SGRQ domains and total score, this was considered a 4-point change;(9) for the CAT, a 2-point change;(2) for the CRQ-Dyspnoea a summed change of 2.5 points; for the CRQ-Fatigue 2.0 points; for the CRQ-Emotion 3.5 points; for the CRQ-Mastery 2.0 points; and for the CRQ-total a summed change of 10 points – these equate to a mean 0.5 point change per question.(10) Furthermore, receiver operating characteristic (ROC) curves were plotted to determine the change in EQ-5D-5L that best discriminated between those who improved

their health status by the established MID in the anchor questionnaires, with equal weighting given to sensitivity and specificity.(2)

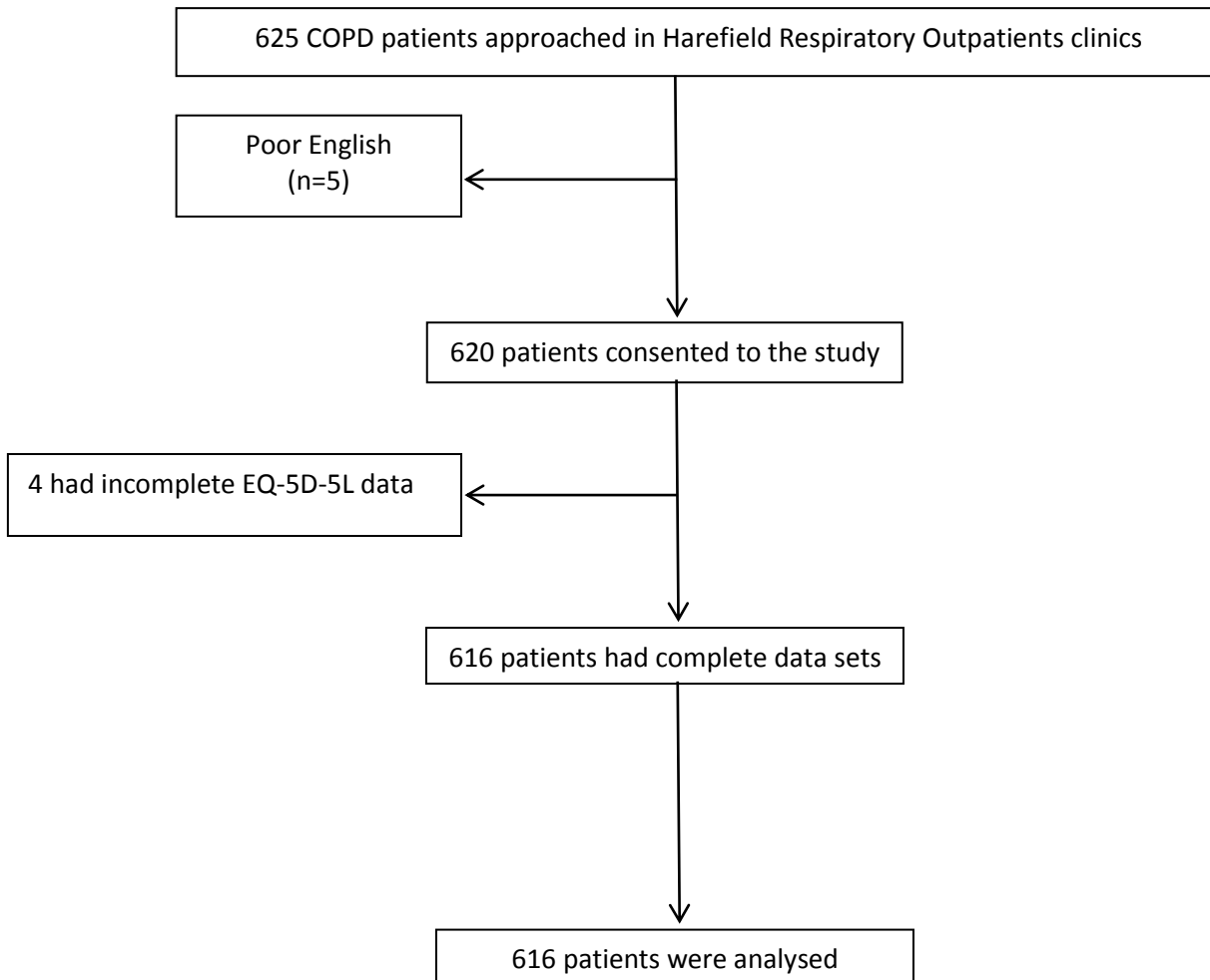
SUPPLEMENTARY – FIGURE 1

The EQ-5D-5L value set for England. Calculation of Utility Index from EQ-5D-5L health states, using a worked example. Taken from <http://www.slideshare.net/OHENews/ohe-seminar-5-l-value-set-oct2014>.

EQ-5D-5L value set for England		Example: the value for health state 23245	
constant	1.000	Constant	=1.000
Mobility = 2	0.057	Minus MO level 2	-0.057
Mobility = 3	0.074		
Mobility = 4	0.207		
Mobility = 5	0.255		
Self care = 2	0.059		
Self care = 3	0.083	Minus SC level 3	-0.083
Self care = 4	0.176		
Self care = 5	0.208		
Usual activities = 2	0.048	Minus UA level 2	-0.048
Usual activities = 3	0.067		
Usual activities = 4	0.165		
Usual activities = 5	0.165		
Pain/discomfort = 2	0.059		
Pain/discomfort = 3	0.079		
Pain/discomfort = 4	0.244	Minus PD level 4	-0.244
Pain/discomfort = 5	0.298		
Anxiety/depression = 2	0.072		
Anxiety/depression = 3	0.099		
Anxiety/depression = 4	0.282		
Anxiety/depression = 5	0.282	Minus AD level 5	-0.282
		State 23245	=0.286

SUPPLEMENTARY – FIGURE 2:

CONSORT diagram for Study 1



SUPPLEMENTARY – TABLE 1: Number (percentage) of patients in each GOLD; MRC Dyspnoea Scale and ethnic categories. N = 616. GOLD = Global Initiative for Chronic Obstructive Lung Disease; MRC Dyspnoea Score = Medical Respiratory Council Dyspnoea Score

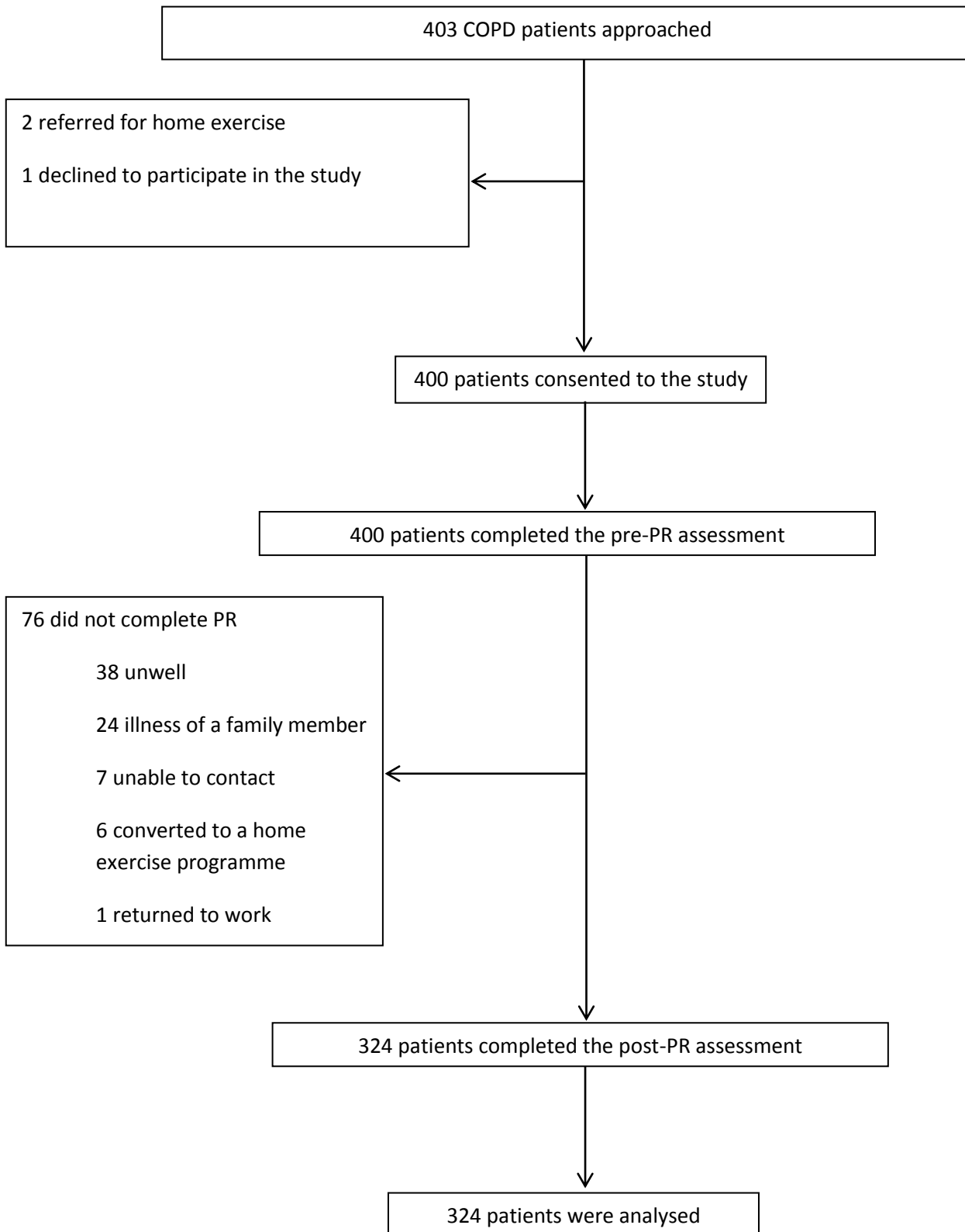
Variable	Number (percentage) of patients
GOLD category	
GOLD I	39 (6)
GOLD II	195 (32)
GOLD III	240 (39)
GOLD IV	142 (23)
MRC Dyspnoea Score	
MRC 1	14 (2)
MRC 2	127 (21)
MRC 3	171 (28)
MRC 4	211 (34)
MRC 5	93 (15)
Ethnicity	
Caucasian	456 (74)
Asian	130 (21)
Oriental	18 (3)
Black	12 (2)

SUPPLEMENTARY- TABLE 2: Slope, Y-intercept and correlation coefficients of change in EQ-5D-5L utility index and visual analogue score (EQ-VAS) with pulmonary rehabilitation (PR) against external anchors. Δ = Change; SGRQ = St George’s Respiratory Questionnaire; CRQ = Chronic Respiratory Questionnaire; CAT=COPD Assessment Test

Variable	Slope	Y–intercept	r	p–value
EQ-5D-5L utility value				
Δ SGRQ Symptoms	-0.000	0.065	-0.05	0.538
Δ SGRQ Activities	-0.001	0.056	-0.12	0.185
Δ SGRQ Impact	-0.001	0.059	-0.13	0.155
Δ SGRQ Total	-0.000	0.060	-0.14	0.127
Δ CRQ Dyspnoea	0.002	0.055	0.25	<0.001
Δ CRQ Fatigue	0.003	0.055	0.29	<0.001
Δ CRQ Emotion	0.003	0.052	0.39	<0.001
Δ CRQ Mastery	0.003	0.055	0.31	<0.001
Δ CRQ Total	0.001	0.048	0.40	<0.001
Δ CAT	-0.003	0.067	-0.14	0.111
EQ-VAS				
Δ SGRQ Symptoms	-0.082	9.173	-0.15	0.084
Δ SGRQ Activities	-0.098	8.893	-0.11	0.205
Δ SGRQ Impact	-0.260	8.274	-0.27	0.002
Δ SGRQ Total	-0.196	8.532	-0.21	0.020
Δ CRQ Dyspnoea	1.001	4.012	0.31	<0.001
Δ CRQ Fatigue	1.372	4.470	0.32	<0.001
Δ CRQ Emotion	0.769	5.300	0.30	<0.001
Δ CRQ Dyspnoea	1.212	5.169	0.30	<0.001
Δ CRQ Fatigue	0.409	2.599	0.38	<0.001
Δ CAT	-0.823	7.995	-0.28	0.001

SUPPLEMENTARY - FIGURE 3

CONSORT DIAGRAM FOR STUDY 2



References

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