Relationship between asthma control status and health-related quality of life in Japan: a cross-sectional mixed-methods study

Supplementary materials

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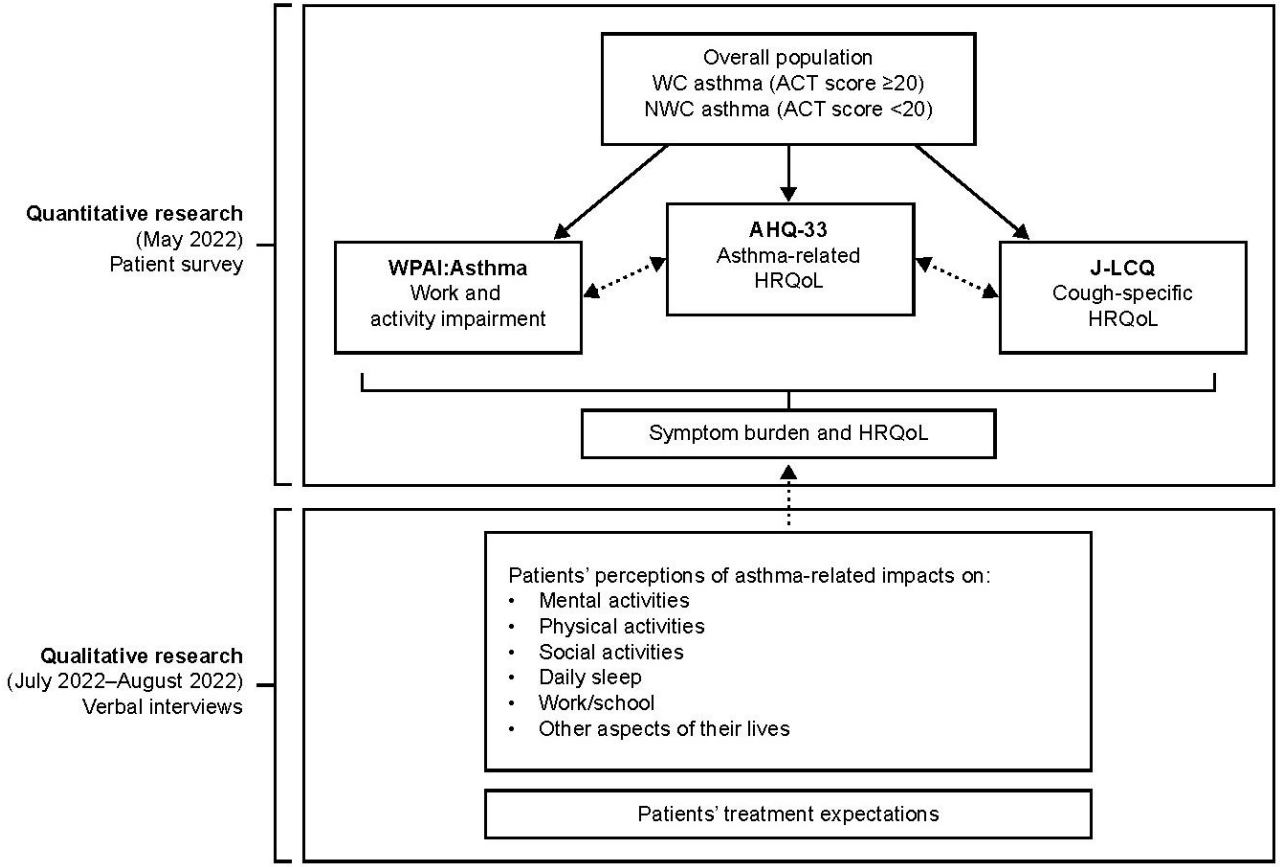
Figure S1. Study design



AHQ-33, 33-item Asthma Health Questionnaire; J-LCQ, Japan Leicester Cough Questionnaire; NWC, not well controlled; WC, well controlled; WPAI, Work Productivity and Activity Impairment.

Table S1. Calculation of 95% CIs for a sample size of N=200 patients in the quantitative research component

$\widehat{P}$ (population proportion with WC or NWC asthma)	**0.1**	**0.3**	**0.5**	**0.7**	**0.9**
Lower limit: $\hat{P} - 1.96\sqrt{\frac{\hat{P}(1-\hat{P})}{n}}$	5.8	23.6	43.1	63.6	85.8
Upper limit: $\hat{P} + 1.96\sqrt{\frac{\hat{P}(1-\hat{P})}{n}}$	14.2	36.4	56.9	76.4	94.2

CI, confidence interval; NWC, not well controlled; WC, well controlled.

Table S2. AHQ-33 scores, overall and by WC and NWC asthma subgroups

		Overall	WC asthma	NWC asthma	p-value[a]	Effect size (r)[b]
AHQ-33		*N=454*	*n=249*	*n=205*		
Total score	Mean (SD)	24.1 (23.3)	11.5 (12.4)	39.3 (24.3)	p<0.0001	r=0.91
	Median (IQR)	17.0 (6.0, 35.0)	7.0 (3.0, 16.0)	35.0 (21.0, 55.0)		
Asthma symptoms	Mean (SD)	6.8 (6.3)	3.3 (3.6)	11.1 (6.3)	p<0.0001	r=0.90
	Median (IQR)	5.0 (2.0, 11.0)	2.0 (1.0, 5.0)	11.0 (6.0, 15.0)		
Factors that worsened symptoms	Mean (SD)	6.2 (6.3)	3.1 (4.0)	9.9 (6.5)	p<0.0001	r=0.83
	Median (IQR)	4.0 (1.0, 10.0)	2.0 (0.0, 4.0)	9.0 (5.0, 14.0)		
Emotion	Mean (SD)	5.1 (6.9)	2.0 (3.5)	8.9 (8.0)	p<0.0001	r=0.72
	Median (IQR)	2.0 (0.0, 8.0)	0.0 (0.0, 2.0)	8.0 (2.0, 14.0)		
Daily activity	Mean (SD)	1.2 (2.3)	0.4 (1.0)	2.3 (2.9)	p<0.0001	r=0.63
	Median (IQR)	0.0 (0.0, 1.0)	0.0 (0.0, 0.0)	1.0 (0.0, 4.0)		
Social activity	Mean (SD)	2.1 (3.3)	0.9 (2.0)	3.6 (4.0)	p<0.0001	r=0.63
	Median (IQR)	0.0 (0.0, 3.0)	0.0 (0.0, 1.0)	2.0 (0.0, 6.0)		
Economics	Mean (SD)	1.0 (1.2)	0.6 (1.0)	1.5 (1.4)	p<0.0001	r=0.49
	Median (IQR)	1.0 (0.0, 2.0)	0.0 (0.0, 1.0)	1.0 (0.0, 2.0)		
Face scale	Mean (SD)	1.6 (1.0)	1.2 (1.0)	2.0 (0.9)	p<0.0001	r=0.58
	Median (IQR)	2.0 (1.0, 2.0)	1.0 (1.0, 2.0)	2.0 (1.0, 3.0)		

[a]Wilcoxon rank-sum tests were used to compare asthma control subgroups; [b]Pearson's correlation coefficient was used to calculate effect size.

AHQ-33, 33-item Asthma Health Questionnaire; IQR, interquartile range; NWC, not well controlled; SD, standard deviation; r, Pearson's correlation coefficient; WC, well controlled.

Table S3. Distribution of responses to the AHQ-33 Asthma symptoms domain[a], overall and by WC and NWC asthma subgroups

	Overall		WC asthma		NWC asthma	
Answer[a]	**0, 1[b]**	**2, 3, 4[c]**	**0, 1[b]**	**2, 3, 4[c]**	**0, 1[b]**	**2, 3, 4[c]**
Symptoms, n (%)						
Cough	268 (59.0)	186 (41.0)	194 (77.9)	55 (22.1)	74 (36.1)	131 (63.9)
Sputum	302 (66.5)	152 (33.5)	198 (79.5)	51 (20.5)	104 (50.7)	101 (49.3)
Wheezing	331 (72.9)	123 (27.1)	227 (91.2)	22 (8.8)	104 (50.7)	101 (49.3)
Exacerbation	373 (82.2)	81 (17.8)	245 (98.4)	4 (1.6)	128 (62.4)	77 (37.6)
Breathlessness	324 (71.4)	130 (28.6)	228 (91.6)	21 (8.4)	96 (46.8)	109 (53.2)
Heaviness in the chest and shoulder	357 (78.6)	97 (21.4)	223 (89.6)	26 (10.4)	134 (65.4)	71 (34.6)
Tightness in the chest	366 (80.6)	88 (19.4)	238 (95.6)	11 (4.4)	128 (62.4)	77 (37.6)
Sleep deprivation	400 (88.1)	54 (11.9)	246 (98.8)	3 (1.2)	154 (75.1)	51 (24.9)

[a]Patients responded to 8 questions in the AHQ-33 Asthma symptoms domain based on how well a statement described their condition (1. 'I have cough'; 2. 'I have sputum'; 3. 'I have wheezing'; 4. 'Exacerbation occurs'; 5. 'I have breathlessness'; 6. 'I have a feeling of heaviness in the chest and shoulder'; 7. 'I have tightness in the chest'; 8. 'It is hardly possible to sleep at night due to asthma') using a 5-point alternative response scale: 0, Not describe well at all; 1, Describe a little; 2, Describe somewhat well; 3, Describe well; 4, Describe very well; [b]the proportions of patients who answered 0–1 was calculated to represent patients with no symptom burden; [c]the proportion of patients who answered 2–4 was calculated to represent patients with symptom burden.

AHQ-33, 33-item Asthma Health Questionnaire; NWC, not well controlled; WC, well controlled

Table S4. Analysis of covariance of AHQ-33, J-LCQ, and WPAI:Asthma scores

		WC asthma (N=249)	NWC asthma (N=205)	p-value[a]
AHQ-33				
Total score	LS Mean (SE)	11.7 (1.2)	39.1 (1.3)	p<0.0001
	95% CI	9.4, 14.1	36.5, 41.7	
Asthma symptoms	LS Mean (SE)	3.4 (0.3)	11.0 (0.4)	p<0.0001
	95% CI	2.8, 4.0	10.3, 11.7	
Factors that worsened symptoms	LS Mean (SE)	3.2 (0.3)	9.8 (0.4)	p<0.0001
	95% CI	2.5, 3.9	9.1, 10.6	
Emotion	LS Mean (SE)	2.0 (0.4)	8.9 (0.4)	p<0.0001
	95% CI	1,3, 2.8	8.0, 9.7	
Daily activity	LS Mean (SE)	0.3 (0.1)	2.3 (0.2)	p<0.0001
	95% CI	0.1, 0.6	2.0, 2.6	
Social activity	LS Mean (SE)	0.9 (0.2)	3.6 (0.2)	p<0.0001
	95% CI	0.5, 1.3	3.2, 4.1	
Economics	LS Mean (SE)	0.6 (0.1)	1.5 (0.1)	p<0.0001
	95% CI	0.5, 0.8	1.3, 1.6	
Face scale	LS Mean (SE)	1.2 (0.1)	2.0 (0.1)	p<0.0001
	95% CI	1.1, 1.3	1.9, 2.1	
J-LCQ				
Total score	LS Mean (SE)	19.1 (0.2)	15.2 (0.2)	p<0.0001

	95% CI	18.8, 19.5	14.9, 15.6	
Physical	LS Mean (SE)	6.2 (0.1)	4.9 (0.1)	p<0.0001
	95% CI	6.1, 6.3	4.7, 5.0	
Psychological	LS Mean (SE)	6.4 (0.1)	5.1 (0.1)	p<0.0001
	95% CI	6.2, 6.5	4.9, 5.2	
Social	LS Mean (SE)	6.6 (0.1)	5.3 (0.1)	p<0.0001
	95% CI	6.5, 6.7	5.2, 5.4	
WPAI:Asthma				
Percent work time missed, %	n	147	131	p=0.1926
	LS Mean (SE)	1.7 (1.1)	3.8 (1.2)	
	95% CI	-0.5, 3.8	1.5, 6.1	
Percent impairment while working, %	n	147	131	p<0.0001
	LS Mean (SE)	6.0 (1.8)	28.8 (1.9)	
	95% CI	2.5, 9.5	25.1, 32.5	
Percent overall work impairment, %	n	147	131	p<0.0001
	LS Mean (SE)	6.9 (1.9)	30.0 (2.1)	
	95% CI	3.1, 10.7	26.0, 34.1	
Percent activity impairment, %	n	248	202	p<0.0001
	LS Mean (SE)	8.0 (1.4)	33.3 (1.6)	
	95% CI	5.1, 10.8	30.2, 36.5	

[a]An analysis of covariance adjusted for presence or absence of work with remuneration (AHQ-33 and J-LCQ only), WC and NWC asthma, age, presence of pets and MMAS score was used to compare asthma control subgroups.

AHQ-33, 33-item Asthma Health Questionnaire; CI, confidence intervals; J-LCQ, Japan Leicester Cough Questionnaire; LS, least squares; NWC, not well controlled; SE, standard error of the mean; WC, well controlled; WPAI, Work Productivity and Activity Impairment.

Table S5. J-LCQ scores and WPAI:Asthma, overall and by WC and NWC asthma subgroups

		Overall	WC asthma	NWC asthma	p-value[a]	Effect size (r)[b]
J-LCQ		*N=454*	*n=249*	*n=205*		
Total score	Mean (SD)	17.4 (3.4)	19.1 (2.0)	15.2 (3.4)	p<0.0001	r=0.86
	Median (IQR)	18.3 (15.5, 20.1)	19.9 (18.1, 20.6)	15.8 (12.8, 17.7)		
Physical	Mean (SD)	5.6 (1.1)	6.2 (0.7)	4.9 (1.1)	p<0.0001	r=0.86
	Median (IQR)	5.9 (4.9, 6.5)	6.4 (5.9, 6.8)	4.9 (4.1, 5.8)		
Psychological	Mean (SD)	5.8 (1.2)	6.4 (0.8)	5.1 (1.2)	p<0.0001	r=0.80
	Median (IQR)	6.1 (5.1, 6.9)	6.6 (6.0, 7.0)	5.1 (4.3, 6.0)		
Social	Mean (SD)	6.0 (1.2)	6.6 (0.7)	5.3 (1.3)	p<0.0001	r=0.80
	Median (IQR)	6.5 (5.5, 7.0)	7.0 (6.3, 7.0)	5.5 (4.5, 6.3)		
WPAI:Asthma						
Percent work time missed, %	n	*278*	*147*	*131*	P<0.0001	r=0.27
	Mean (SD)	2.7 (13.4)	1.6 (11.6)	3.8 (15.0)		
	Median (IQR)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)	0.0 (0.0, 0.0)		
Percent impairment while working, %	n	*278*	*147*	*131*	p<0.0001	r=0.59
	Mean (SD)	16.8 (24.1)	6.0 (13.7)	28.9 (27.3)		
	Median (IQR)	5.0 (0.0, 20.0)	0.0 (0.0, 10.0)	20.0 (10.0, 50.0)		
Percent overall work impairment, %	n	*278*	*147*	*131*	p<0.0001	r=0.59
	Mean (SD)	17.8 (26.0)	6.9 (17.0)	30.1 (28.7)		
	Median (IQR)	5.0 (0.0, 20.0)	0.0 (0.0, 10.0)	20.0 (10.0, 51.0)		
Percent activity impairment, %	n	*450*	*248*	*202*	p<0.0001	r=0.77

	Mean (SD)	19.4 (26.0)	7.9 (16.7)	33.5 (28.3)		
	Median (IQR)	10.0 (0.0, 30.0)	0.0 (0.0, 10.0)	20.0 (10.0, 60.0)		

[a]Wilcoxon rank-sum tests were used to compare asthma control subgroups; [b]Pearson's correlation coefficient was used to calculate effect size.

IQR, interquartile range; J-LCQ, Japan Leicester Cough Questionnaire; NWC, not well controlled; SD, standard deviation; r, Pearson's correlation coefficient; WC, well controlled; WPAI, Work Productivity and Activity Impairment.

Table S6. Correlation[a] between AHQ-33 (total score and domains) and J-LCQ (total score and domains), overall and by WC and NWC asthma subgroups

AHQ-33	J-LCQ	Overall Spearman's rank correlation coefficient	WC asthma Spearman's rank correlation coefficient	NWC asthma Spearman's rank correlation coefficient
Total score	**Total score**	-0.8020	-0.6714	-0.6972
	Physical	-0.8132	-0.6739	-0.7185
	Psychological	-0.7483	-0.6050	-0.6604
	Social	-0.7407	-0.5654	-0.6345
Asthmatic symptoms	**Total score**	-0.7349	-0.6231	-0.5307
	Physical	-0.7637	-0.6378	-0.5981
	Psychological	-0.6817	-0.5546	-0.4798
	Social	-0.6574	-0.4895	-0.4659
Factors which worsened symptoms	**Total score**	-0.6674	-0.4646	-0.4825
	Physical	-0.6821	-0.4529	-0.5568
	Psychological	-0.6202	-0.4289	-0.4318
	Social	-0.6192	-0.4288	-0.4155
Emotion	**Total score**	-0.7008	-0.5217	-0.6503
	Physical	-0.6907	-0.5094	-0.6273
	Psychological	-0.6689	-0.4945	-0.6464
	Social	-0.6633	-0.4719	-0.5975

Daily activity	**Total score**	-0.5400	-0.3213	-0.4631
	Physical	-0.5306	-0.3132	-0.4236
	Psychological	-0.5163	-0.3256	-0.4403
	Social	-0.5385	-0.3207	-0.4588
Social activity	**Total score**	-0.6487	-0.4572	-0.6210
	Physical	-0.6322	-0.4296	-0.5810
	Psychological	-0.6175	-0.4337	-0.6058
	Social	-0.6365	-0.4617	-0.5929
Economics	**Total score**	-0.5109	-0.4023	-0.4512
	Physical	-0.5112	-0.4067	-0.4142
	Psychological	-0.4753	-0.3636	-0.4418
	Social	-0.4882	-0.3778	-0.4398
Face scale	**Total score**	-0.5856	-0.4820	-0.5014
	Physical	-0.6230	-0.5142	-0.5627
	Psychological	-0.5238	-0.4161	-0.4221
	Social	-0.5143	-0.3214	-0.4692

[a]Correlation was measured using Spearman's rank correlation coefficient.

AHQ-33, 33-item Asthma Health Questionnaire; J-LCQ, Japan Leicester Cough Questionnaire; NWC, not well controlled; WC, well controlled.

Table S7. Correlation[a] between AHQ-33 (total score and domains) and WPAI:Asthma (total score and domains), overall and by WC and NWC asthma subgroups

AHQ-33	WPAI:Asthma	**Overall** Spearman's rank correlation coefficient	**WC asthma** Spearman's rank correlation coefficient	**NWC asthma** Spearman's rank correlation coefficient
Total score	**Percent work time missed**	0.3091	0.0923	0.2855
	Percent impairment while working	0.6982	0.4347	0.6719
	Percent overall work impairment	0.6928	0.4338	0.6656
	Percent activity impairment	0.7155	0.4924	0.6659
Asthmatic symptoms	**Percent work time missed**	0.2491	0.0863	0.1576
	Percent impairment while working	0.6152	0.3913	0.4964
	Percent overall work impairment	0.6086	0.3910	0.4850
	Percent activity impairment	0.6410	0.4244	0.4870
Factors which worsened symptoms	**Percent work time missed**	0.2376	0.0525	0.1710
	Percent impairment while working	0.5681	0.3646	0.4106
	Percent overall work impairment	0.5622	0.3628	0.4067
	Percent activity impairment	0.6108	0.4211	0.4501

Emotion	**Percent work time missed**	0.3202	0.0976	0.3061
	Percent impairment while working	0.6582	0.3839	0.6673
	Percent overall work impairment	0.6549	0.3843	0.6659
	Percent activity impairment	0.6418	0.4040	0.6112
Daily activity	**Percent work time missed**	0.2583	0.0895	0.2214
	Percent impairment while working	0.5569	0.3192	0.5056
	Percent overall work impairment	0.5499	0.3165	0.4982
	Percent activity impairment	0.5256	0.3108	0.4925
Social activity	**Percent work time missed**	0.2847	0.1488	0.2457
	Percent impairment while working	0.5734	0.3882	0.5656
	Percent overall work impairment	0.5719	0.3900	0.5626
	Percent activity impairment	0.5907	0.3426	0.5972
Economics	**Percent work time missed**	0.2532	0.1067	0.2226
	Percent impairment while working	0.4805	0.3560	0.4369
	Percent overall work impairment	0.4805	0.3570	0.4396
	Percent activity impairment	0.4641	0.3122	0.4467

Face scale	**Percent work time missed**	0.2531	0.1193	0.2307
	Percent impairment while working	0.5255	0.3283	0.5201
	Percent overall work impairment	0.5252	0.3294	0.5204
	Percent activity impairment	0.5366	0.2927	0.5558

[a]Correlation was measured using Spearman's rank correlation coefficient.

AHQ-33, 33-item Asthma Health Questionnaire; NWC, not well controlled; WC, well controlled; WPAI, Work Productivity and Activity Impairment.

Table S8. Patient characteristics (qualitative research component)

	Total (NWC asthma) N=20
Age, mean (SD)	48.3 (10.0)
Sex, n (%)	
Male	13 (65.0)
Female	7 (35.0)
I don't want to answer	0 (0.0)
Asthma duration, n (%)	
<1 year	1 (5.0)
≥1–<3 years	1 (5.0)
≥3–<10 years	6 (30.0)
≥10 years	12 (60.0)
Comorbidities, n (%)	
Pollinosis (allergic rhinitis)	7 (35.0)
Rhinosinusitis (empyema)	2 (10.0)
Atopic dermatitis	3 (15.0)
Gastroesophageal reflux disease	0 (0.0)
Pulmonary aspergillosis	0 (0.0)
Other	13 (65.0)
None	6 (30.0)
Status of infectious disease, n (%)	
Yes	1 (5.0)
No	19 (95.0)
I don't want to answer	0 (0.0)

NWC, not well controlled; SD, standard deviation.

Table S9. AHQ-33, J-LCQ and WPAI:Asthma scores for patients in the qualitative research component

		Total (NWC asthma) N=20
AHQ-33		
Total score	Mean (SD)	40.7 (22.1)
	Median (IQR)	35.5 (26.0, 54.0)
Asthma symptoms	Mean (SD)	13.0 (6.1)
	Median (IQR)	14.0 (9.5, 14.0)
Factors that worsened symptoms	Mean (SD)	9.2 (5.2)
	Median (IQR)	8.0 (6.0, 12.5)
Emotion	Mean (SD)	9.1 (7.8)
	Median (IQR)	8.0 (2.0, 16.0)
Daily activity	Mean (SD)	2.4 (2.8)
	Median (IQR)	1.0 (0.0, 4.5)
Social activity	Mean (SD)	3.7 (4.3)
	Median (IQR)	2.0 (0.5, 4.5)
Economics	Mean (SD)	1.3 (1.0)
	Median (IQR)	1.0 (0.0, 2.0)
Face scale	Mean (SD)	2.1 (0.8)
	Median (IQR)	2.0 (2.0, 2.0)
J-LCQ		
Total score	Mean (SD)	14.9 (3.2)
	Median (IQR)	15.3 (13.7, 16.6)
Physical	Mean (SD)	4.8 (1.1)
	Median (IQR)	4.8 (4.4, 5.4)
Psychological	Mean (SD)	5.0 (1.1)
	Median (IQR)	5.0 (4.4, 5.6)
Social	Mean (SD)	5.2 (1.3)
	Median (IQR)	5.6 (4.8, 6.0)
WPAI:Asthma		
Percent work time missed, %	Mean (SD)	1.8 (5.0)
	Median (IQR)	0.0 (0.0, 0.0)
Percent impairment while working, %	Mean (SD)	28.2 (26.5)

	Median (IQR)	20.0 (10.0, 40.0)
Percent overall work impairment, %	Mean (SD)	29.0 (27.3)
	Median (IQR)	20.0 (10.0, 40.0)
Percent activity impairment, %	Mean (SD)	27.0 (24.1)
	Median (IQR)	20.0 (10.0, 45.0)

AHQ-33, 33-item Asthma Health Questionnaire; IQR, interquartile range; J-LCQ, Japan Leicester Cough Questionnaire; NWC, not well controlled; SD, standard deviation; WPAI, Work Productivity and Activity Impairment.

Table S10. Classification of emergent themes in the qualitative research component

Theme number	Theme	Sub-theme
1	Patients' expectations for asthma medications	Effective and safe medicines Easy-to-use medications Medicines with reasonable costs Preventive treatments
2	Emotional burden in relation to asthma symptoms	Current emotional burden that patients experienced due to asthma symptoms Anxiety about the future
3	Impacts of asthma on patients' social and daily activities	Burdens on social activities Burdens on daily activities
4	Patients' perceptions about communication with physicians	Patients give up obtaining solutions and better prescriptions Patients expect having solutions and better prescriptions
5	Patients' remorse when symptoms manifest around people	Feeling of guilt for family, friends, and co-workers
6	Difficulties related to peer understanding	Patients did not tell others about their disease for various reasons Patients expect understanding from their peers
7	Impacts of asthma on work	Impacts on work employment Impacts on work attendance Performance at work
8	Misunderstandings and psychological burdens during the COVID-19 pandemic	Psychological burdens due to misunderstandings Anxiety for asthma worsening due to COVID-19 Anxiety for COVID-19 worsening due to asthma

9	Sleep deprivation caused by asthma symptoms	Patients with physical burdens due to sleep deprivation Patients with psychological burdens due to sleep deprivation Patients with problems at work and in their daily lives due to sleep deprivation

COVID-19, Coronavirus Disease 2019.

Table S11. Patients' quotes categorised by emergent theme in the qualitative research component

Theme	Patient code[a]	Quote
Theme 1. Patients' expectations for asthma medications	E	*（どんな薬があったらよいかという問いに対して）『発作薬を使っても（喘息が）治まらなかった時に、緊急的に何かせめて病院に行くぐらいの力が出るぐらいの、ちょっとした何か自分でできる...何か自己注射じゃないけれども、そんなような緊急的なものがあると良いなっていう風には思います。』*
		(In response to the question, 'what kind of medication would you like to have?') 'When my asthma does not go away even with medication for spasms, I think it would be good if there was something I could do by myself... like a self-injection, but something for urgent needs that would at least give me enough strength to go to the hospital.'
	D	*（もし理想の薬ができるとしたらどういう薬がよいと思うかという問いに対して）『理想の薬ったって喘息が起こんないような薬があればいいっていうそれだけですね。だから喘息の発作が起こってどうこうするっていうよりも起こんなければ一番いいんで』*
		(In response to the question about what kind of medication would be ideal) 'The ideal medicine is, of course, medication that prevents asthmatic symptoms. So it is not the one that works after asthmatic symptoms, but the one that prevents asthmatic symptoms, that is the best.'
	A	*（どういうお薬があったら対象者の生活の満足度が上がると思うかという問いに対して）『あとはアレルギーの薬で肝臓の数値が上がっちゃったということがありますから副作用がないのが。穏やかでもいいので毎日飲まなきゃいけないんだったらとにかく副作用がないのが欲しいです。』*
		(In response to the question about what kind of medication would improve life satisfaction) 'Also, I prefer medication that does not cause side effect. My liver levels went up when I took medicines for allergy. I would rather have medication that works mildly, but without any side effect. Even if I need to take medication every day.'
	K	*（過去の喘息による制限の体験について聞かれて）『それで、最初の初期症状でヒューヒューしてるなっていうときにサルタノールインヘラーを吸引するともうほぼ潰せる。逆にそこで症状が出てから長くなればなるほど効かなくなるんだよね。（中略）なんか、もうダメだったね。すごい急激な温度差。山だからたぶん15度ぐらい気温も下がったのかな。そうしたらダメで、サルタノールも全然ダメというのを思い出した。それは1回あった。雪が降っているときはダメなんだなと思った。』*
		(Asked about the experience of restrictions due to asthma) '...And, when I felt I got breathlessness, I inhaled Salbutamol and that worked very quickly. But it would not work if it was after the symptom and it lasted for a while. ...Well, that was really hard. I had a sudden temperature decrease. I think the temperature decreased by about 15 degrees because that was on the mountain. Then, it didn't work at all, I mean, Salbutamol didn't work at all. I had this experience once. I thought it would not work well when snowing.'

	I	*（薬を長く使い続けることによる体への影響について聞かれて）『多分エリプタは、副作用は多分、副腎皮質ホルモンを使ってる薬だと思うので、多分長期間連用する薬ではないので、あんまり使い続けてはいけないかなって思ってます。』*
		'I think Ellipta, if I remember correctly, may cause side effect because it contains corticosteroids, so it is probably not a drug I should use continuously for a long time. I don't think I should continue using it too long.'
	K	*（薬が対象者の身体に対し負担になることに対し、どういう気持ちで服薬しているかという問いに対して）『でも薬ってどっちかだと思う。要は効果を求めたらやっぱり身体への負担が出るし、逆に身体への負担がないものって効果って弱いと思う。（中略）ある程度効果を求めたらやっぱり身体への負担ってのはそれに比例してくるもんだと思ってますけどね。』*
		(In response to the question, 'When you take medication that causes physical burdens, how would you feel?') 'But medication has both sides. I mean, if I want medication that is effective, that causes burdens in my body and when I take medication that has less side effect, the medication may not be effective enough. ...Generally, if you want effectiveness to a certain degree, I think you get more physical burdens to your body as you ask more effectiveness of the medication.'
	Q	*（毎日薬を飲むことへの思いを尋ねられて）『まあ、やっぱりちょっと面倒くさいなっていう気持ちは若干ありますけど。』*
		(How do you feel that you need to take medicines every day?) 'Well, it bothers me, a little.'
	F	*（期待する治療薬を尋ねられて）『勿論、例えば極論を言えば 1 週間ごとに 1 回、飲むか何かするだけでいいような薬があれば、すごく楽ですよね。それで治まっていて、病院も 2 カ月に 1 回でいいとか、そんなのがあればすごく助かりますけど。』*
		(Asked about what medication would be good) 'Of course, if I say in an extreme way, I want the medicine that allows me to take only once a week. That is really easy. Also, it is really helpful if the medication is effective enough to reduce the number of hospital visits, let's say, maybe just once every two months.'
	K	*『（吸入器は）嵩張るね。う～ん、嵩張る。薄っぺらいなら良い。携帯みたいに薄っぺらかったら別に。（中略）サルタノールがコンパクトになると良いかな。でっかいもんね、これね。ほら、こんな感じだよ。』*
		'The device is really bulky. Well, yeah, it is really big. It is good if it's thinner, like a mobile phone. ...I wish Salbutamol would become more compact. It is surely big, you know, about this big, the device is like this (The patient held the device and showed it in the screen).'
	A	*（吸入薬の使いづらさについて聞かれて）『指が動かないのでキャップをキュッと取って、取った後カチッと回しますよね。その間が普通の人は指で持って操作するんですよ。私の場合は手の平でキュッと挟んで。パンダが笹を持つような感じ。（中略）シムビコートから円形のカタツムリみたいな機械になった時は先生*

		にこれは使えませんと無理を言ってお願いをしてまたシムビコートに戻してもらったんですけど。非常にあの機械は使いにくいです。』
		(Asked about the difficulty of using the inhaler) 'I can't move fingers, but I need to take the cap off and rotate it. Normally, people do this with fingers. But in my case, I hold the cap with my palms. Like a panda holding bamboo grasses. ...When I got the round device like a snail, I told the doctor that I could not use this and asked him to change it back to Symbicort. It was really hard to use that device.'
	A	*（どういった薬が良いかという問いに対して）『介護する人間が飲ませやすくて、できれば1日に1回で済ませてほしい。1日3回も飲むような薬だと非常に介護が大変になりますし、（中略）（自分が負担なく飲める薬は）1日1回くらいの頻度で飲みやすい形状だったらいいなと思います。』*
		(In response to the question about what kind of medicine is best) '...I want it to be easy for a caregiver to give, and if possible, I would like medication that I need to take only once a day. If I have to take the medication three times a day, it makes it very difficult for a caregiver to take care of me. ...I wish the medication would be a once-a-day formula and easy to take.'
	Q	*（吸入の手間について尋ねられて）『その、なんか、手順があって、息を吸入してから2秒、ん、何秒だったかな...、まあ、2回吸入をしなければいけないというのと、あとなんか途中でちょっと、息を止めなければいけないという動作があるんで、そういう動作がもうちょっと簡単にできるような吸入とかがあればいいのかなと思うんですけど。』*
		(Asked about the difficulty of inhalation) 'Well, hmm, there is a procedure, we need to breathe and 2 seconds, well, forgot how many seconds ...but, we need to inhale twice anyway. And, ah, on the way, we need to stop breathing, so it is nice if we can have such a device that helps us do the procedure more easily.'
	T	*『経済的負担は、あると思います。喘息薬って結構、はい、高いイメージなので。吸入が高いんですかね。3カ月に1回で、えっと2万ぐらいですかね。』*
		'I think I feel economic burdens. Medicines for asthma, yes, are generally expensive. Inhalers are expensive, I think. Well, one inhaler for three months costs about 20,000 yen.'
	G	*『コスト的にも吸入剤ってまだまだ高いっていうイメージがすごくあって、保険を使って3割負担にしてもやっぱり高いっていう印象が私自身働いていてもありますし、自分が吸っていてもありますので、結構安くなったり、ジェネリックですかね。』*
		'I have an image that inhalers are expensive. Even if I use insurance which pays 30% of the cost, I would still feel that they are expensive when I work in the pharma and also use inhalers myself. Even if inhalers become more affordable, the best we can expect will be when they become generic drugs.'

	C	*『出始めると逆に吸いにくくなってしまうので、逆に吹き戻してしまうような感じになってしまって。だからもうなる前にちょっとなんとか察知して先にやっておかないと何もできない状態になってしまいます。』*
		'When asthma attack starts, it's hard to inhale, it gets like I'm blowing it back the other way. So, if I don't detect some kind of a sign and do something in advance, there will be nothing I can do any more.'
	F	*『半分夢みたいな話ですけど。自動的に何か、体の中のそういうものを検知して、予防できるような。脈拍とかだと iPhone のあれとか、Apple ウォッチとか何か。しかも血圧とかぐらいは測るんでしょうけど。そういうので何か、自動的にわかって、危険を予知してくれるような、そんな機能みたいな医療器具があればと思うんですけど。それで薬を事前に飲んでおけば予防できるとか、そんな。ちょっと夢みたいな話なんですけど。』*
		'It may not sound very realistic, but something that automatically detects a certain sign inside the body to allow me to take medication in advance, and prevents symptoms …it's like, for a pulse rate, that stuff (app) in iPhone or Apple Watch. I assume it (app) would at least measure things like blood pressure. I wish I could have something like that, something that automatically detects and predicts potential risks, a medical device with such functions. And, if I take medication in advance, the medication will prevent symptoms, or something like that. It sounds like a dream though.'
Theme 2. Emotional burden in relation to asthma symptoms	S	*『うん、自分が小さくなるような、普段イラッとしないことでも（頭重感があることで）ちょっとイラッとしてしまうようなことはやっぱりありますよ。』*
		'Yes, I feel like I'm being very touchy about small things, sometimes I get a little irritated by things that don't normally irritate me because of the heavy-headedness'
	N	*『喘息があるがゆえに、「もう、うんざりだよ、もうやめてくれよ」と。「もう十分だ。これ以上、咳はしたくないよ」と思うんです。』*
		'Every time when I get symptoms, I think "I'm sick of it. Please someone stop this", and "This is enough. I don't want to cough any longer".
	K	*『う〜ん…。まぁ、割り切っているね、もうね。どうにもならないからさ。割り切っている。だからそのときに何をどうしたい、何かを恨む、何かにあたるっていうのはないかな。』*
		'Ummm …well, I think I have just accepted (the difficulty to keep talking due to coughing). Yes, you know, there is nothing I can do. I have accepted it. So, I don't think I want to do something to deal with it, curse or blame it on something when I have such difficulty.'
	S	*『うーん、普通の人よりも、より健康に気を使った生活を送らないといけないし、毎日薬を飲まないといけないっていう。普通の生活をするために、普通の人よりも 1 工程増えるじゃないですか。薬を飲んだり、病院に行ったりするっていう、そこが、はい。その何かをしないといけないっていうことに対して劣等感があります。何かをしないと普通の生活が送れないという。』*

		'Well, I need to be careful about the health more than normal people, I need to take medicines every day. To live a normal life, it's like I need to spend time more than healthy people do, isn't it? Taking medicines, going to hospitals. Those things, yes, I feel inferiority complex for the fact that I need to do these that others don't normally do. I cannot have normal life without doing tasks.'
	O	*（吸入の手間について尋ねられて）『(健常者と喘息持ってるご自身は違うって感じします?)違うと思いますね。（中略）例えば保険とかにも入れないですもんね。』*
		(Do you think you are different than healthy persons?) 'Yes I think we are different. ...For example, I cannot request the same insurance as theirs, right?'
	D	*『あの～、そういう状態（発作気味の状態）から、あの～、ひどい発作につながるっていうことが、まああるんですよね。ですからそうならないように、あの～、慎重に、慎重に行動せざるをえないし、そうなることに対する不安感っていうのは結構ありますね。』*
		'Well, the worsening condition of asthma, hmm, the worsening can be exacerbation. So not to get exacerbation, well, carefully, I need to behave carefully, and I'm really worried that I might get exacerbation.'
	I	*『（朝）起きた時にすごいけっこう大きな発作になってしまって、なんか吸入器効かなかったらどうしようとか、なんか仕事に行けるかなぁとか、どうかなぁという、そういう心配があります。不安です。』*
		'I get a really, heavy exacerbation when I wake up (in the morning), and I'm worried about what to do if the inhalation doesn't work properly, or if I can go to work, perhaps not, these kinds of things, I feel anxiety for these.'
	Q	*『喘息がきっかけで、その、あの、他の病気を誘発する恐れ、まあ、肺炎とかそういったのになる恐れがあるんじゃないかなという不安はありますね。』*
		'Because of asthma, well, ah, the chance asthma can lead any other disease, well, like pneumonia. I'm worried that I might get other diseases.'
	T	*（喘息であることで負担に感じていることを聞かれて）『今は働いているから、いいんですけど、年金生活になった時に、多分割と、そこ（経済的）のウエイトが大きくなると思うので、ちょっとどうなのかなって。ちゃんと計算していないですけど。』*
		(Asked about burdens from having asthma) 'I am working, so it's okay now, but when I start living on a pension, I think, unexpectedly, the importance there (financially), would weigh more in my life , so I wonder what it would be like. ...I haven't calculated it properly yet.'
	B	*『今はまだ若いからいいけど、気管支が弱ってきたときに発作で野垂れ死ぬことがあるのかなと思ったりします。...あとは 60、70 になったときに気管支が弱ってきたときにこの対処で大丈夫なのかなという不安ですね。自分が老いたときの不安を感じたりしますね。』*

		'I'm okay now because I'm still young, I'm worried that I might have an attack and end up dying by the roadside when my bronchial tubes are weaker due to aging. ...And when I become 60, 70 years old and my bronchial tubes are weaker, I will be worried if the current treatment works. I have anxiety for the future.'
	Q	*『う〜ん、まあ、自分はもう、あの、（喘息に）かかってるからまあいいんですけど、ただちょっと、娘たちもちょっと喘息の症状があるので、だからそういう、今後その、自分の子孫とかが喘息持ちになるんじゃないかなという不安はありますね、はい。』*
		'Well, I already have asthma, that's OK though, my daughters also have the symptoms, so I am worried that my descendants will have asthma in the future, yes.'
Theme 3. Impacts of asthma on patients' social and daily activities	M	*『20 代の頃から喘息なので、（運動を）やめるように。最初はよくわからなかったですからね。その咳が止まらないとか。そういうことだったので、だからその運動っていうのはなるべく、しないようにするっていうとちょっと語弊があるかもしんないんですけど、やるとつらい時があったので、そこからあんまりしないようになりましたね。』*
		'I have had asthma since I was in my 20s, so I started giving up (exercising). I didn't understand very well in the beginning, why I just couldn't stop coughing after exercise. So, this is why I tried not to do exercise as much as possible. This may sound a little exaggerated though. When I exercised, it sometimes really got to me. So, I kind of stopped doing exercise from that time on.'
	I	*『（喘息があることで）楽しみな予定はあっても、心底楽しめなさそうな気がします。（中略）せっかくの旅行を楽しみたいのに朝いきなり喘息の発作があったとしたらもうそれで、次の日に何かあってその日の予定を楽しめないかな〜って。寝不足のまま出かけるみたいな。嫌だなって。』*
		'When I have a plan I look forward to, I don't think I can enjoy it from the bottom of my heart, because of asthma. ...I am looking forward to the trip and really want to enjoy it, but if I get exacerbation suddenly in the morning, I don't think I can enjoy the plan on that day. You know, I need to go out without getting enough sleep. I don't like it.'
	C	*（特に影響を感じて辛いとか厳しいのはどういう時ですか。）『もともと映画館に行って映画を見たりとか美術館に行ったりとかもうできなくなるんですよね。咳がやっぱり結構あると静かなところも。図書館もそうなんですけどちょっと出掛けにくくなったりもしますし、そっちは精神的なものが大きいんですかね。』*
		(When do you feel distressed because of asthma?)'...I cannot go to theatres and museums any longer. I cough often so I cannot go to quiet places like these. Library is one of them, so I cannot go there. I feel distressed because of this.'
	O	*『まあ、（運動を）やりたくてもね、（喘息症状が出ると）やれないわけなんで。やるせない感じですかね。』*
		'Well, I want to play sports, but I cannot when I get the symptoms. I feel downhearted.'

	F	*（挫折感を感じるのはどういう時ですか。）『それはやっぱり、そうやっていろんな制約が出てきて好きなこともしたいこともできないし、というので。挫折っていうか、まあ、うまくいかないなっていう思いですよね。』*
		(When do you feel frustration?) 'It is actually when I am restricted from doing things I like. Feeling frustrated...well, how should I put it? It is like things aren't going well.'
	B	*『喘息症状が起こっているときに余計に息を吐かないといけないので、すごい息継ぎをするんです。ヒューヒュー言いながらしゃべるので相手もすごく心配をするんですよね。そういうのもあって会話をするときに辛いときがあるという感じですかね。』*
		'I need to exhale a lot more when I get the symptoms, and that makes me breathe harder. I talk with wheezing sounds, so the person I talk with gets worried very much. Because of that, I sometimes feel distressed when I chat with someone.'
	E	*『やっぱり本当は職場の何か、結構今はあんまりないんですけれども、コロナ前は職場の懇親会などもあったので、そういったところで行けないっていう風になってしまうと、ちょっと心苦しいなって思ってしまうことが多いんです。』*
		'In fact those with my co-workers, well, I don't have many opportunities now in the pandemic, but I often had social gatherings with my co-workers before the Coronavirus pandemic. I often felt a little bit sorry if I could not join when I had such opportunities in those days.'
	C	*『（友人から）せっかく好意を持って誘ってくれるんですけれども、迷惑をかけたくないので結局断らざるを得ない感じになって、だんだん誘われなくなってしまう感じですね。』*
		'(My friends) mean well and invite me, but I don't want to bother them, so I end up turning down their invitations. They gradually stop asking me.'
	N	*『ちゃんとした生活ができていないので、せめてちゃんとした生活ができるようになる、喘息が止まるような薬を、少しでも咳が減る薬を今でも探しています。（ちゃんとした生活とは、どのように考えておられますか。）だから、咳が止まって、自分でお金が稼げて、電車にも乗れて、車を普通に運転ができて、というのが普通の生活じゃないですかね。』*
		'I am not living a normal life, so I am still looking for a medicine that will at least help me to live a normal life, will stop my asthma, and will reduce my coughing as much as possible. (What do you consider a decent life?) I think a normal life means that you can stop coughing, earn your own money, take train, and drive a car normally.'
	N	*『運転中に（喘息発作が）出る確率は少ないけど、できれば運転したくないです。ちょっと怖いです。あの、池袋の事件のように、わからない状態でというのが一番怖いです。』*
		'The chance of having (an asthma attack) while driving is small, but I don't want to drive if possible. I am a little scared. I am most afraid of being in an unconscious state, like the Ikebukuro incident.'

	O	*『まあそういったこと（子供の教育のためペットを飼うこと）ができないっていうのは、まあ1つ損をしてるってわけじゃないんですけど、他の人ができることをさせられてないって感じはしますけど。』*
		'Well, I don't think that not being able to do such a thing (having a pet for the sake of child's education) is a loss, but I feel like my children have to give up things that others can do.'
	D	*『アレルゲンがハウスダストと絹なんですよ。だから掃除とかホコリの舞うようなことはちょっと自分はしませんし。（中略）掃除機かけるのはダメですね。あのー、排気口から何か細かい、あれが特に苦手で、テキメンにかゆくなっちゃうんですよ。うん。』*
		'The allergens are house dust and silk. So I don't do things like cleaning that spreads dust in the air. ...Vacuuming is no good. Well, vacuuming is no good for me because something like particles spread out from the exhaust vent that makes me really itchy, yes.'
	D	*『焼き魚や油ということであれば、それを使って料理、まあ、換気がすごくできていればいいんですけれども、そうじゃないとちょっとやっぱりダメだし、（中略）喘息の発作につながるんじゃないかというような行動は避ける傾向にありますね。』*
		'If it is grilled fish or oil, cooking with it (oil), well, as long as it is well-ventilated, it is fine, but if it is not, I don't feel well. ...I tend to avoid activities that may lead to asthma attacks.'
	T	*『もうちょっと体力をつけたかったので、そういった意味で、やっぱりその...若い時に、「やはりちょっと体力づくりをしておかないと」と、思っていたので健康の面に関して。そこが（喘息のせいで運動が）できなかったのが、やっぱりちょっと残念だとは思いますけど。（中略）若い頃から体力づくりをして、もう少し頑張れたかなというふうに思います。（中略）（不安なことを尋ねられて）今、お話したように、やっぱり運動のところが...はい、不安に思うというか。しっかり運動したいのに、できないっていう。体力づくりもお話ししたと思うんですが、そういうところも、しっかりやりたかったけれども。将来的に、あまり長生きしたいとは思いませんけど、ある程度まで、えーと、生きていたほうがいいかなと思うので。』*
		'I wanted to be built up my body a bit more, so in that sense, I mean, when I was young, I thought "I need to build up my physical strength a little more", so, I was a little disappointed that I couldn't do that (exercise) because of asthma. ...I think I could have worked a little harder if I did not have asthma. ...(Asked why he had anxiety) as I mentioned, I was worried because of the exercise limitation ...yes, I feel nervous about it. I wanted to exercise, but I couldn't. I think I told you that I wanted to build up my body. Although I wanted to do that I was not able to do so. I don't think I want to live very long in the future, well, I mean, I don't want to live too long, but I think it would be better if I can live till at least the average age.'
Theme 4. Patients'	M	*『自分が期待してないのかもしれないですね。一番求めているのがこの（喘息の）つらさを抑えて欲しいっていうところだけですから。（心情を）わかって欲しいとは、あんまり思ってないので。』*

perceptions about communication with physicians		*'Maybe I am not expecting much. What I really want is to make this asthma less painful. I don't particularly think that I want my doctor to understand my feelings.'*
	Q	*（対象者が、喘息の症状による日常生活への影響の出現を医師に伝えた場合に、医師が治療法の変更を考えてくれることに対して）『あんまり、正直なところあんまり期待してないですね。』*
		(Regarding the situation where the patient informs the doctor about the impact of asthma symptoms on his/her daily life and the doctor considers changing the treatment) 'Not much, I don't really expect much to be honest.'
	R	*『通院もしてたんですけど、原因は何だろうという感じだったのでいろんな不信感とかもあったりしたとは思います。（誰に対する不信感か尋ねられ）その時かかっていたお医者さんですよね。』*
		'I also attended the hospital, but was not sure about the cause for my symptoms, and maybe had distrust or something for many things.' (Asked about whom the patient distrusted) 'The doctor I used to see.'
	K	*（『喘息に関連した精神的負担については医師に伝えない』という語りに対して理由を聞かれて）『言っても仕方がないし。だから自分が求めているのは、医者に求めているのは結局治療だけであってメンタルをどうにかしてってわけじゃないから。（中略）だからそういう質問（精神的負担に関する質問）をしたいのはその専門の人に話すし、かかりつけ医と話しているのは喘息の気管支炎のことを話している。』*
		(When asked why, in response to the narrative) 'I don't tell my doctor about the mental burden related to my asthma because it doesn't help even if I tell him. So what I'm looking for, what I'm looking for from a doctor is just treatment after all, not to do something about my mental health. ...So if I want to ask those questions about mental burdens, I'll talk to such a specialist. When I see my doctor, I just talk about my asthma bronchitis.'
	B	*『土曜日に行っているんですけどすごい患者さんが多いですね。話をするのなら人が少ないときに行って主治医の先生とゆっくり話ができるような機会があればいいのかなと思いますね。』*
		'I usually go there on Saturday, but so many patients are there. To have a conversation with my doctor, I think I should visit when fewer patients are there. I wish I can have an opportunity to take time and have a good conversation with my doctor.'
	T	*（医師との診察では、喘息による生活への影響のこともよく話すのか、それとも症状のみを簡潔に話すのかという問いに対して）『ちょうど...2 カ月ぐらい前までは、もう本当にお薬を出してもらうだけだったんですけど、その階段のこともしんどいっていうお話もしていたんだけど、まあ、あまり...なんていうんですかね、それに対しての対症療法は、あまりしてもらえなかったんですけど。』*
		(*When asked whether he often talks about the impact of asthma on his life or only briefly about the symptoms) 'Just...until about two months ago, I was really just given medication, but I also talked about how hard it was for me to use stairs. Well, my doctor didn't do much, how should I put it…he didn't give me treatment for that very much.'*

	G	*（対象者の不安感に対して医師がどんな反応をしてくれたら良かったかという問いに対して）『患者は神様とまではいかないですけど、先生を頼って言っているからこそ、その立場、こういう症状があってつらいんだっていうのをもうちょっとわかってほしかったなっていうのは今になると思いますね。』*
		(In response to a question about what kind of response the doctor should have given to the patient's sense of anxiety) '...I wouldn't go so far as to say that the patient is God, but because the patient relies on the doctor, I wish the doctor understood his/her position and the pain I am going through because of these symptoms. I wish he would understand I am suffering from these symptoms.'
	N	*『支障が出ていることは話していますし、「今は仕事ができない、仕事がほとんどないんですよ」と話をしていますが、詳しくは話していません。（中略）（なぜ話さないか尋ねられ）いや、そこまで話していいのかな、お医者さんに。それが自分の中であります。今通っているのはアレルギー科の国立病院ですが、そこまでいくと総合診療院じゃないとダメなのかなとか思っちゃうし。』*
		'I already told my doctor about the disturbance I had (due to my asthma), and said to him/her, "I can't work right now, and I have very little work to do." But I never talked about it in detail. ...(Asked about why he doesn't talk much about it) I am not sure, but should I really talk about such (personal) things with my doctor? I think that way. Right now, I go to a national hospital for allergies, but when I want to talk about those things related to personal, I wonder if I should go to a general hospital'
	S	*（仮に自分の気持ちの負担を医師に話せば、医師が治療法を考えたり、別の治療薬が出てくるといった期待はあるかという問いに対して）『ああ、そういうのはあるかもしれないですね。　（中略）（病院が負担とか悩みごとを相談する場ではない、と考えるのはどうしてかと問われて）それ（病院は気持ちの負担や悩みごとを相談する場ではない、と対象者自身が考えていること）は確かに固定観念かもしれないですね、僕の中での。はい。なので、そう言われてみるとちょっと相談してみようかなっていうふうに思ってきました。僕、今。』*
		(Asked if the patient has any expectation that his/her doctor will come up with a new treatment or another medication if the patient talk about his/her feelings) 'Oh, yes. I think so. ...(Asked why he thinks that hospitals are not a place to discuss burdens and problems) That (the patient's thought that hospitals are not a place to discuss burdens and problems) may be a preconception. In my mind. Yes, so, after hearing that, I started thinking that maybe I should consult with my doctor.'
	P	*『先生は野球あまりやらないらしいんですけど、サーファーなんでそういうスポーツの感じで話はよくしますね。』*
		'My doctor doesn't play baseball very much, but he's a surfer, so we discuss things through sports, like, often talk about physical burdens and stuff like that when playing sports.'

	C	*『やっぱりお医者さんにももうなんて言うんですかね、いろんな方がおられて、全く親身になってくれない先生もいらっしゃって、簡単に百日咳だから薬飲んでくださいっていう方からいろんなものを試していただける方も（いて）、漢方からいろいろまるっと見てくださる先生が今の先生なので比較的信頼のある先生なんですけども、いろいろ試して効き目がなかったりとかちょっと副作用がきつかったらもうやめよう、次のを試してみようっていうような感じでやっていただいている先生なので、比較的ちょっと話はするようになってます。（中略）比較的今の先生にはプライベートのそういう部分以外のことは話をしてて、なんて言うんですかね、自分の最終のゴールというかこうなりたいという話はしているので、ある程度理解はしてもらっているかなとは思うんですよ。』*
		'When it comes to types of doctors, there are many different types. Some doctors are not kind at all, and simply tell me "This is whooping cough and you should take the medicine for that." Some other types of doctors are willing to try many different things like Chinese medicine. My current doctor is such a doctor, and relatively trustworthy. After trying several things, if they don't really show effect, or if the side effects are too severe, he will stop and try a different one, so I relatively talk more about treatment with the doctor. ...I talk with my current doctor relatively more about things, though I don't talk about things too personal, and I have told him about my ultimate goal or what I wanted to be like, so I think he understands me to a certain extent.'
Theme 5. Patients' remorse when symptoms manifest around people	L	*『一緒に寝てて私が咳をしてると(子供を)起こしちゃうし、それはすごい申し訳ないですね。』*
		'When we are sleeping together and I'm coughing, I wake my child up, and I feel really sorry about that.'
	G	*『でもなんか自分のせいでタバコとかを我慢させてしまっていることに対して申し訳ないなっていうふうに思うんですかね』*
		'But I feel sorry for making them give up smoking and other things because of me.'
	O	*『うーん、やっぱりその～、ねっ、子どもとかにも何かを育てるということはすごくいい影響だとは思うので。まあそういったことができないっていうのは、まあ 1 つ損をしてるってわけじゃないんですけど、他の人ができることをさせられてないって感じはしますけど。（ペットを飼えない気持ちを尋ねられて）まあ、すごく申し訳ないなとは思っていますけど。』*
		'I think it gives a great effect for children to nurture something like a pet. Well, if they can't do that, well, it's not a loss, but I feel like they can't do what other children can do. (Asked about the feeling when her children can't keep a pet) Well, I feel very sorry.'
	M	*『（喘息で呼吸が）つらいとあんまりやっぱり仕事もはかどらないんですよね、集中力とか。それで、もたもた仕事をしているとどうしても猫に一番影響があって、エサを自動であげるのに、スマホのアプリで何時に出すとやっているので、そんなんで猫に一番影響ありますかね。かわいそうですかね。』*

		'When I have trouble breathing due to asthma, I can't concentrate on my work very well. I use an app on my smartphone to automatically feed the cat and set the time to put the food out, so I wonder if that affects my cat the most. I feel sorry for my cat.'
	C	*（自分が喘息であることで、家族や友人など周りの人に迷惑をかけてると思うことはあるかと問われて）『そうですね。（中略）気を使われるのって結構しんどいんですよ。使ってもらえないと悲しいのもありますけど、使われ過ぎるのもやっぱりしんどいんですよね。なんか悪いことしてるなっていうイメージがあるので。（気を遣われることによるしんどさがどのようなものかについて聞かれて）（中略）やっぱり気を使われて何かちょっとやっぱり引け目を感じてしまうんですよね。悪いことをしているっていう感じになってしまうので。』*
		(When asked if he/she ever feels that his/her asthma causes inconvenience to other people like his/her family and friends) 'Yes. ...It makes me feel bad when people take extra care of me. I feel sad if people don't care about my asthma at all, but it is also stressful to see people are taking too much care of me. It gives me the image that I'm doing something wrong. ...(When asked about the awkward feeling because of other people's extra attention to him) Well, I feel a little awkward because people are taking extra care of me. It makes me feel like I'm doing something wrong.'
Theme 6. Difficulties related to peer understanding	T	*（喘息を持っていることを周囲に伝えているか問われて）『咳をしたりとか、していると「風邪ですか」とか、「アレルギーですか」って言われた時は、「いや、喘息です」って言いますけど。聞かれた時とか以外は、自分からは（喘息だと）言わないです。』*
		(Asked if he/she tells people he/she knows that he/she has asthma) 'When I am coughing, someone will say, "Do you have a cold?" Or, "Do you have allergy?" Then, I will say, "No, I have asthma." I don't tell people that I have asthma unless they ask (such questions).'
	M	*『喘息だったんですかって言われるだけで、それをいちいち異動があると言うのが面倒臭いなっていうだけで、何か言われることもないですし。元気そうなのにどうしたんですって。言いたくないっていうより、言いたくないことないんですけど、別にね。ああそうか、この人知らなかったよなーとか。』*
		'When someone asks if I have asthma, I just don't want to bother to answer the question every time I have a job transfer at my workplace. Nobody asks why I take off from work even though I look just fine and what is wrong with me. I would not bother to say, I mean, it doesn't really bother me to say that, not really, oh yeah, this guy did not know (that I have asthma).'
	S	*（自分が喘息持ちであることで生活や気持ちに対してどんな影響があるかと聞かれて）『普通の人よりちょっと、何か機能的に、人間の機能的に劣っているというような、なんか劣等感みたいなものは常に感じてますね。はい。（どうして劣等感を感じているのかと問われて）やっぱり持病があるからです。喘息という。』*

		(Asked what effect having asthma has on his/her life and feelings) 'I always feel a little bit inferior to normal people, like I'm inferior in some way, functionally, in terms of functions normal people can usually perform. Yes. (Asked why he feels inferior) Because I have this chronic disease. Asthma.'
	B	*『仕事関係とかであればあまり言わないんですけど、例えば職場であったりとか町内会とか、定期的に会うようなところでは（自分が喘息だと）言ったりすることはありますね。（中略）基本的に心配されたくないから説明をするのだけど、他の人だったらそのステップは必要ないわけなので、そのステップを踏まないといけないのは慣れているとはいえ気が重いですよね。心配されるよりも心配させたことが私としては基本的に嫌なところがありますので』*
		'If I talk to somebody work-related, whom I don't see very often, I don't talk about my asthma very much, but for example, at my workplace or a neighbourhood association meeting, such places where I meet the same people on a regular basis, I usually explain about my asthma because I don't want them to worry about me. I don't have to go through this step for other people, so it bothers me when I have to go through it even though I am really used to doing so. Basically, I feel more uncomfortable when I make them worry about me than when they are just worried about me.'
	S	*（奥さんは喘息に関しては快く思ってない感じかと問われて）『うーん。まあずっとなんですけども、うん、快くは思ってないですね。あんまし理解がない。』*
		(Asked if his wife is not very happy about his asthma) 'Umm…well, she has always been like this, yeah, she has never been very happy about my asthma, and she doesn't really have a good understanding of it.'
	N	*『今は少し咳が出ない時もあるので「ポストにチラシの配布でもやれば」と（妻に言われるから）、まだ理解してもらえてないんだと思う。（中略）（その時の心情は）ネガティブのほうが強かったですね。』*
		'Because sometimes I am not coughing a lot now, (my wife says) "Why don't you distribute flyers in mailboxes or something to make some money?', so I assume she still doesn't really understand my asthma. (Omitted) (How I felt at that time) I had more negative feelings.'
	M	*『職場がね、わりとその配慮してくれる人たちって、やっぱりね、周りは看護師さんばかりなので、（中略）だいたいの人はちょっと何かヒューヒューいってたもんねとか、ああやっぱりつらいのとか、わからなくても、つらいのとか、わりと声を掛け合う職場なんですよ、うちは。』*
		'At my workplace, people are considerate for me, of course, because I am surrounded by so many nurses. …Most of them say something like, "I heard your wheezing", "Oh, I know you don't feel good", or, "Do you feel bad?", even when they are not sure. This kind of workplace, where people often care about others and talk to each other. My workplace is like that.'
	N	*『喘息を、どういう病気かわかってほしい。どんな状態になって、どうして動けないのか。』*
		'I want people to understand asthma, what kind of disease it is, what condition I have and why I can't move.'

Theme 7. Impacts of asthma on work	N	*『人を相手にすることは、仕事自体を回してくれませんよね、「喘息があるんだ、じゃあ、できないね」と言われてしまいます。例えばコンビニのアルバイトとか。 やっぱり（履歴書の）病気のところに「咳、喘息」と書くと、それだけで...多分それだけだと思うけど、履歴書は戻ってきますね。』*
		'If it is a job dealing with people, there is no opportunity for me to get such a job, you know, it goes like, 'You have asthma. You cannot work, then'. A part-time job in a convenience store is one example. My resume was returned to me when I wrote "asthma" in the disease section. Just like that…I think that was the only reason why I was rejected, though.'
	A	*『仕事を失わないために喘息のことがバレないように（仕事に臨んでいた）。（中略） それ（喘息の症状）で仕事に支障をきたして、そうしたら仕事が来なくなりますから、そういう意味でごまかし切ることを考えていました』*
		'I worked in the way not to be found out that I have asthma, and not to lose my job. …If I get some troubles at work due to the symptoms, I will lose job. In that respect, I always tried to hide the symptoms.'
	H	*『（喘息の影響で早退するかを尋ねられ）それはありました。昨日の夜に喘息が出たから今日は休みます。また（喘息が）出るかもしれないので、というのは何回かあります。』*
		(Asked if the patient has ever left work earlier due to asthma) 'Yes I have. I had to say, " I had the symptoms last night, so I need to take off today." There were such occasions several times.'
	I	*（喘息による不安について聞かれて）『起きた時にすごいけっこう大きな発作になってしまって、なんか吸入器効かなかったらどうしようとか、なんか仕事に行けるかなぁとか、どうかなぁという、そういう心配があります。不安です。』*
		(Asked about the anxiety caused by asthma) 'When I get up and a severe attack occurs, I get worried about what if I get serious exacerbation and the inhaler doesn't work. Can I really go to work or what should I do? I have anxiety like this. I'm worried.'
	P	*『（会議中に）話を聞いている時に急に出ちゃう時もありますし、自分が発表してる時に、急にゲホゲホ～ッと止まらなくなっちゃうとか。』*
		I get coughs during the meeting, and I get the symptom and cannot stop it when I give a presentation.'
	S	*（寝てる時に発作が起きることによる睡眠不足で日常生活や仕事に支障はあるかという問いに対して）『やっぱりあります。（中略）まず発作が起きて呼吸が困難になると、その時点で頭が痛くなってくるんですね。それでまあ、発作止めをすぐ打って寝れれば多少なりとも睡眠はできるんですけども、寝た気がやっぱりしない。朝起きた時にちょっと疲れてる。（中略）仕事行くんですけれども、まあ若干日中眠くなりますよね。はい。』*

		(In response to the question about disturbance in daily life or work due to an attack while sleeping) 'Yes, there is. ...First of all, when I have an attack and have difficulty breathing, I get a headache at that point. If I take medication for spasms right away and go to bed, I can get some sleep, but I don't feel like I slept at all. When I wake up in the morning, I feel a little tired. ...I go to work, but I feel a little sleepy during the day. Yes.'
	M	*『職場がね、わりとその配慮してくれる人たちって、やっぱりね、周りは看護師さんばかりなので、わりとあるんですけど、うちの教授はダメですねっていう意味ですね。（中略）だからそういうの（他人の辛さ）がわからない人には、まったくわかってもらえないですね。』*
		'In the office, I am surrounded by nurses, so they have understandings and considerations towards asthma, but the professor is no good. ...I mean, such a person who doesn't sympathize others, would not understand me at all.'
Theme 8. Misunderstandings and psychological burdens during the COVID-19 pandemic	P	*『電車ではないんですけど、バスですね。「咳してんのにバス乗ってくんじゃねえ」みたいな感じのを、まあ年寄りからよく。』*
		'It was in the bus, not in the train actually. An elderly person said to me, "Don't get in the bus when you are coughing", well, I get this kind of comments often.'
	M	*『調子が悪い時はちょっと(初対面の人達と会うのは気が重いなと)思いますね。で、それはなぜって言ったら特に今ってコロナ禍ですから、呼吸（で感染する）ってちょっと今でこそあんまりないのかもしれませんが、最初のコロナって、まだうまいことわかってなかった時代、1 年目とか、あのときってやっぱり、つらいと咳が出る時もあってあえて私喘息なんだっていうことを言ってましたね。うつらないよとか。』*
		'I think I feel a bit awkward to meet someone I don't know when I am not feeling well because of asthma. Well, you know, that is because it is under the Corona pandemic now, and it is hardly possible that people get infected by my breath, but you know, when we were not sure what was going on, like it is one year before, I believe, I always told that I had asthma when I got cough and felt ill. Like you know, to say they won't get infected with coronavirus by asthma in those days.'
	G	*『コロナが流行り出してから自分が思っていることなんですけど、流行る前までは電車内で少し咳き込んだりとか、深めの咳っていうんですか、ゴホゴホした咳をしても、チラッと見られるぐらいで、視線を感じたりするということはあまりなかったように思うんですけど、このコロナが流行り出した 2 年、3 年前ぐらいからは、出かけて、やっぱり電車の中でもたまに出てしまうことがあったんですけれども、それで嫌な目線を感じたというか、そういうのを感じることが多いので』*
		'What I have been feeling after the Corona pandemic started though, I mean, in the past, people used to glance at me only a moment when I coughed a little, or coughed deeply, even when I went like "cough cough". But in these two or three years after coronavirus has spread, I sometimes got the symptoms when I went out, and I often felt that someone gave me a dirty look in the train.'

	G	*『いや、まあこのご時世だからそう思われても仕方ないっていうのはわかるし、そう思われている方が一定数いるのはわかってはいるんですけど、やっぱり自分が悪気があって咳をしているわけではないので、歯がゆいっていうか』*
		'Well, you know, I understand that people could misunderstand me (that I had COVID-19), and I know there was a number of people who would misunderstand, but it was annoying, actually, I didn't cough on purpose anyway.'
	G	*『説明したところで逆にもっと倍になって返ってきたりとかっていうのもあったので、うーん...なんて言えばいいのかわかんないですけど。』*
		'Even when I explained that my coughing was from asthma, they talked back to me even twice as much ...ummm, well, I don't know what to say, but you know…'
	G	*『さっきも説明したように電車の中とかで、何回もそうですね、年配の方、それこそマスクをしてない方から、ちょっと咳き込んでマスクをしている私が手で押さえたり、ハンカチで押さえてよく飛ばないようにしてむせてしまったりして、それで言われてしまうとうんざり感じるという感じです。』*
		'As I explained before, in the train or something, so many times already, an elderly person, who did not even wear a mask, had to say something to me when I was coughing and holding a mask with my hands, and also holding a handkerchief not to spread my breath, but I ended up choking on it. I feel fed up with this kind of thing.'
	K	*『わかると思うんだけど今、コロナじゃん。だからそこなんですよ。まだコロナに1回も感染していないんだけど、月1回行く病院が苦で、コロナが移っちゃうんじゃないかなと。（中略）今までは病院が月1ぐらいだから面倒くさいけど別に月1くらいだからそんなに自分の中でも抵抗感とかはなかったんだけど、令和になってからちょっと怖いよね。』*
		'As you know, we are in the pandemic now. That is the reason. I haven't been infected with coronavirus yet, so it is scary to go to the hospital even if it is only once a month. I might get coronavirus in the hospital. ...I thought it was just once a month that I needed to go to the hospital and did not hesitate at all, but it is a bit scary now after Reiwa era.'
	K	*『だから病院に行くのが今は抵抗だよね。コロナになりたくないんで。コロナになって喘息が出てくる可能性がゼロではないじゃないですか。』*
		'So I don't really want to go to the hospital now. I don't want to get coronavirus. It is not zero percent that I will start having asthmatic symptoms after getting coronavirus, is it.'
	I	*『今コロナの感染者が増えているかと思うんですけれど、そういうウイルスに対して、もしコロナにかかってしまったら相当ひどくなりそう、なるんじゃないかなという恐怖があります。』*
		'I understand that the number of infected people has been increasing, and I have a fear of such a virus. If I get coronavirus, I think I will get infected very severely because of asthma. I'm afraid that it can be very severe'
	I	*『そういう何か感染症にかかった時に重症化してしまうんじゃないかっていうことですね。』*

		'I'm worried that asthmatic symptoms will be very severe if I get such an infectious disease (like COVID-19).'
Theme 9. Sleep deprivation caused by asthma symptoms	M	*『調子が悪い時は夜中に何度も目が覚めて、でも自分は眠たいので、よくは何かわからないんですよね。ただ目が覚めているなと思うだけなんですけど、翌日とかは、しばらく経って考えてみると、そっか喘息なんだっていう感じですね。（中略）どちらかというと、その自分の呼吸がしづらい感じです。』*
		'When I felt unwell, I woke up many times during the night, but I was so sleepy that my brain was not working, I didn't really know what was going on. I just thought "I'm awake", but the next day, after a while I recalled it, I realized it was asthma. ...If I need to describe the symptom, I would say it was breathlessness.'
	J	*（症状の出やすいタイミングを尋ねられて）『寝る前とかが一番ひどいかなっていう気はしますけど。（中略）発作っぽくなって咳が止まらないなという時に、今寝たいのに咳のせいで寝れないじゃないかって思うんで。』*
		(Asked when symptoms are most likely to occur) 'I think it gets worse before going to bed. ...When I'm having exacerbation and can't stop coughing, I get like, I want to sleep now but I can't because of the cough.'
	G	*『なんだろう、寝かけている時に発作が起きてしまって、発作が結構時間が長めに起きることがあるので、それで（寝るのが）遅くなってしまう感じです。寝られる時もあるし、ひどい時だと 1 時間寝たら...寝れるか寝れないかぐらいで発作が出てしまうという時もあるし』*
		'I don't know, I have exacerbation when I'm about to sleep, and sometimes spasms last quite a long time, so it gets quite late when I fall asleep. In some cases, I can fall asleep, and sometimes, if it's really bad, I can sleep only for an hour and then...well I am sometimes about to fall asleep but wake up again because of exacerbation.'
	S	*『もう、夜やっぱり発作が起きると、うん、眠れないですよね。（中略）あ、もう気づいたらちょっと苦しいですよ。起きたら。で、ちょっと苦しいなと思って起きるんですね、そうするとどんどん、あの、さらに苦しくなってきます。』*
		'When I have exacerbation at night, I can't sleep, of course. ...Oh, before I know it, I'm already suffering from breathing—when I wake up. And then, I feel breathlessness, and that wakes me up. It will get worse and worse, um, I will suffer more after waking up.'
	I	*『（熟睡できない、日中疲れてることで）眠くなってしまったり、集中力が続かなくなってしまっていて』*
		(Because of the sleeplessness and tiredness during the daytime) 'I get sleepy and I can't keep focusing on things.'
	S	*『（夜間喘息があると）睡眠時間が普段 5、6 時間の人が 2、3 時間くらいしか寝てないよ、眠い、みたいな。』*
		'When I got the symptoms at night, I thought, oh, I slept for only 2 or 3 hours even though I normally sleep 5 or 6 hours. I am so sleepy.'

	J	*『咳がひどくて、寝れなくて疲れることが続いたりしたので。（中略）睡眠時間が削られるのが嫌だなという感情は必ず持ちますね。』*
		'I had severe cough, couldn't sleep and got really tired—I had such sleepless nights, for a few days in a row. ...I always have the feeling that I can't stand it when I lose sleeping time.'
	L	*『うーん。普段あんまり症状がないとかだと、寝れないことに関して辛さはないんですけど、喘息が出てて寝れない時は寝ようとしても咳が出て起こされちゃうのでイライラしたり。（中略）眠たくて、眠たくて寝ようとしているところに咳が出て起こされると、すごくイライラするんですよ。』*
		'Ummm. If I don't have symptoms, I don't feel distressed when I can't sleep. But when I have asthma and can't go to sleep, I keep coughing and that keeps me awake even though I am trying to get some sleep. That makes me frustrated. ...I get very frustrated when I'm trying to sleep but can't sleep because of coughing.'
	B	*『仕事というより寝ているときに発作が起きるのが一番つらいので、それがどうにかならないかなといつも思います。』*
		'I always wonder if there is anything I can do to prevent spasms at night because it is hardest for me to have exacerbation when I am sleeping rather than at work.'
	Q	*『やっぱりちょっと寝付けなくて、夜中に、あの〜、その、発作で起きて、もう、2〜3 時間ちょっと眠れない状態が続いて、もう朝を迎えて、寝不足になれば出勤したことはあります。（中略）まあ、ちょっと寝不足でちょっと、あの〜、仕事がはかどらないかなという感じですかね。』*
		'I couldn't sleep and I woke up in the middle of the night because of an attack and couldn't sleep for a couple of hours, and then I realized that the morning came, so I went to work without getting enough sleep. ...Well, I guess I had some problems while at work because of lack of sleep.'
	J	*『自分の中では決めているルーティンがあるんだろうなって思うんですよね。だからルーティンが、例えば、僕は 6 時間以上寝てないとうまくいかないことが多いなとか、それは今までいろんなことをしている中で、自分の（経験の）中で。』*
		'I think I have a routine set for myself. So, to do the routine, for example, I often have to sleep more than 6 hours to make it work. I learned this from what I went through up until now, my own (experience).'
	G	*『その、やっぱり夜に出やすいというのがあるので、睡眠時間が短くなってしまうのがあって、それで仕事がお休みがちになってしまったりする』*
		'Well, I tend to have these symptoms at night, and I get less sleeping time, so I often take off from work...'
	S	*『（夜間喘息があると）睡眠時間が普段 5、6 時間の人が 2、3 時間くらいしか寝てないよ、眠い、みたいな。うん。やっぱりそれに近いような仕事のはかどらなさですかね、はい。』*

		‘(When I have nocturnal asthma,) it's like, I usually sleep 5 or 6 hours, but I only sleep about 2 or 3 hours. I get so sleepy. Yes, I'm sleepy. That annoys me and I can’t focus on work, really.’
	L	*『（睡眠不足でどんなことにイライラするか尋ねられ）やっぱり子どもが小さいので、子どもがやることをやらなかったり、普段の生活なら怒らないところでも怒っちゃったりとか。余裕がなくなるんですかね。』*
		(When asked what frustrates him due to lack of sleep) ‘I have small children, so when they don't do things they should do, I get angry at them although I wouldn't normally get angry in those situations in my daily life. I guess I don’t have much room in my mind.’

[a]Patients participating in qualitative interviews were anonymised and assigned a letter from A–T.

ACT, Asthma Control Test; COVID-19, Coronavirus Disease 2019.

Table S12. Conceptual saturation analysis of qualitative interviews

	Group 1					Group 2					Group 3					Group 4					S
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	
Theme 1. Patients' expectations for asthma medications	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	20
Theme 2. Emotional burden in relation to asthma symptoms	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	20
Theme 3. Impacts of asthma on patients' social and daily activities	S	S	S	S	S	S	S	N	S	S	S	S	S	S	S	S	S	S	S	S	19
Theme 4. Patients' perceptions about communication with physicians	S	S	S	S	N	S	S	S	S	S	S	S	S	S	S	S	S	S	S	S	19
Theme 5. Patients' remorse when symptoms manifest around people	N	S	S	S	S	S	S	S	N	S	N	S	S	S	S	S	S	S	S	S	17
Theme 6. Difficulties related to peer understanding	N	S	S	N	S	S	S	N	N	S	S	S	S	S	S	S	S	N	S	S	15
Theme 7. Impacts of asthma on work	S	S	S	N	S	S	S	S	S	S	S	N	S	S	N	S	S	N	S	N	15
Theme 8. Misunderstandings and psychological burdens during the COVID-19 pandemic	N	N	S	N	N	S	S	S	S	S	S	S	S	S	S	S	N	S	N	S	14
Theme 9. Sleep deprivation caused by asthmatic symptoms	S	S	S	N	S	S	S	N	S	S	S	S	S	N	S	N	S	N	S	N	14

COVID-19, Coronavirus disease 2019; N, not reported; S, reported spontaneously.