

**Table (1) Comparison between patients with asthma (n=144) and COPD (n=156) according to demographic data and smoking history:**

Variables	Asthma	COPD	P value
<b>Age/year</b> Mean $\pm$ SD Median (range)	39.22 $\pm$ 13.51 40 (12-70)	63.01 $\pm$ 10.58 61 (35-95)	<0.0001
<b>Gender</b> Males Females	41 (28.47%) 103 (71.53%)	123 (78.85%) 33 (21.15%)	<0.0001
<b>Residence</b> Rural Urban	58 (40.28%) 86 (59.72%)	95 (60.90%) 61 (39.10%)	<0.0001
<b>BMI</b> Mean $\pm$ SD Median (range)	27.02 $\pm$ 4.86 25.55(19.6-43.5)	24.94 $\pm$ 3.73 24.3(16-47.6)	<0.0001
<b>Educational level</b> Illiterate Primary Secondary Graduate Postgraduate	65 (45.14%) 25 (17.36%) 43 (29.86%) 5 (3.47%) 6 (4.17%)	134 (85.90%) 12 (7.69%) 6 (3.85%) 1 (0.64%) 3 (1.92%)	<0.0001
<b>Socioeconomic status</b> Low Middle High	10 (6.94%) 129 (89.58%) 5 (3.47%)	27 (17.31%) 125 (80.13%) 4 (2.56%)	0.02
<b>Smoking status</b> Non Ex-smoker Stop smoking Current smoker	130 (90.28%) 8 (5.55%) 3 (2.1%) 3 (2.1%)	35 (22.4%) 83 (53.2%) 16 (10.3%) 22 (14.1%)	<0.001
<b>Smoking index</b> Mild Moderate Heavy	2 (20%) 1 (10%) 7 (70%)	79 (77.5%) 2 (2%) 21 (20.5%)	<0.001
<b>Total number for SI</b>	10	102	

SI: smoking index

**Table(2)Distribution of the studied population according to number of inhaler and start of use of inhaler (N=300):**

Parameter	Asthma N (%)	COPD N (%)	Total N (%)
<b>One inhaler</b> -Naive patients -Patients on treatment	56 70	55 68	111 (44.58%) 138 (55.42%)
<b>Total</b>	126	123	249 (100%)
<b>Two inhaler</b> -Naive patients - Patients on treatment	0 20	0 31	0 (0%) 51(100%)
<b>Total</b>	20	31	51 (100%)

**Table(3) Pattern of adherence in the studied population**

Pattern	Naive patients N (%)	Patients already on treatment*N (%)	Total	P value
Good	25	99	124 (35.32%)	0.00
Intermediate	0	103	103 (29.34%)	
Poor	86	38	124 (35.32%)	
<b>Total</b>	111	240	351(100%)	

**Table (4): Comparison between patients with asthma and COPD according to medications:**

Variables	Asthma	COPD	Total	P value
<b>Frequency of inhaler administration</b>				
Once	3 (2.7%)	33 (25.4%)	36 (15%)	<0.001
Twice	83 (75.5%)	83 (63.8%)	166 (69.2%)	
on need	24 (21.8%)	14 (63.8%)	38 (15.8%)	
<b>Onset of action of inhaler</b>				
5 minutes	36 (32.7%)	69 (53.1%)	105 (43.7%)	<0.001
20 minutes	2 (1.9%)	1 (0.8%)	3 (1.3%)	
5-20 minutes	36 (32.7%)	11 (8.4%)	47 (19.6%)	
30 minutes	36 (32.7%)	49 (37.7%)	85 (35.4%)	
<b>Type of device</b>				
Aerolizer	37 (33.6%)	66 (50.8%)	103 (42.9%)	<0.001
MDI	23 (20.9%)	16 (12.3%)	39 (16.3%)	
Turbohaler	38 (34.6%)	12 (9.2%)	50 (20.8%)	
Handihaler	2 (1.8%)	20 (15.4%)	22 (9.2%)	
Diskus	7 (6.4%)	6 (4.6%)	13 (5.4%)	
Breezhaler	1 (0.9%)	9 (6.9%)	10 (4.2%)	
Respimat	0 (0.0%)	1 (0.8%)	1 (0.4%)	
Evohaler	2 (1.8%)	0 (0.0%)	2 (0.8%)	
<b>Type of drug</b>				
Budesonide	27 (24.5%)	17 (13.1%)	44 (18.3%)	<0.001
Formetrol	11 (10.0%)	49 (37.7%)	60 (25%)	
Salbutamol	23 (20.9%)	13 (10.0%)	36 (15%)	
Budesonide formetrol	37 (33.6%)	12 (9.2%)	49 (20.4%)	
Fluticasone salmetrol	8 (7.4%)	6 (4.6%)	14 (5.8%)	
Glycopyrinum bromide	1 (0.9%)	5 (3.8%)	6 (2.5%)	
Tiotropium	2 (1.8%)	21 (16.2%)	23 (9.6%)	
Ipratropium	1 (0.9%)	1 (0.8%)	2 (0.8%)	
Formetrolbeclomethasone	0 (0.0%)	2 (1.5%)	2 (0.8%)	
Indicatrol	0 (0.0%)	1 (0.8%)	1 (0.4%)	
Indicatrolglycopyrinum	0 (0.0%)	3 (2.3%)	3 (1.3%)	

**N.B:**Number of drug used more than patients as some patients use more than one drug **MDI:**meterd dose inhale

**Table(5)Relation between demographic data and adherence pattern in asthmatic patients already on therapy (n=110):**

<b>Variables</b>	<b>Good</b>	<b>Intermediate</b>	<b>Poor</b>	<b>Total</b>	<b>P value</b>
<b>Age/year</b>					
Mean $\pm$ SD	43.82 $\pm$ 13.501	42.61 $\pm$ 13.05	37.56 $\pm$ 15.84	41.86 $\pm$ 14.06	0.082
Median (range)	46 (16-70)	45 (13-67)	34 (14-70)	42 (13-70)	
<b>Gender:</b>					
Males	12 (26.7%)	9 (23.7%)	11 (40.7%)	32 (29.1%)	0.295
Females	33 (73.3%)	29 (76.3%)	16 (59.3%)	78 (70.9%)	
<b>Residence:</b>					
Rural	19 (42.2%)	13 (34.2%)	11 (40.7%)	43 (39.1%)	0.742
Urban	26 (57.8%)	25 (65.8%)	16 (59.3%)	67 (60.9%)	
<b>Educational level</b>					
Illiterate	24 (53.3%)	20 (52.6%)	11 (40.7%)	55 (50%)	0.563
Primary	6 (13.3%)	8 (21.1%)	4 (14.8%)	18 (16.4%)	
Secondary	14 (31.1%)	9 (23.7%)	9 (33.3%)	32 (29.1%)	
Graduate	0 (0.0%)	1 (2.6%)	1 (3.7%)	2 (1.8%)	
Postgraduate	1 (2.2%)	0 (0.0%)	2 (7.4%)	3 (2.7%)	
<b>Socioeconomic status</b>					
Low	0 (0.0%)	2 (5.3%)	2 (7.4%)	4 (3.6%)	0.05
Middle	45 (100%)	36 (94.7%)	23 (85.2%)	104 (94.5%)	
High	0 (0.0%)	0 (0.0%)	2 (7.4%)	2 (1.8%)	
<b>Smoking status</b>					
Non	42 (93.3%)	34 (89.5%)	21 (77.8%)	97 (88.2%)	0.289
Ex-smoker	3 (6.7%)	3 (7.9%)	3 (11.1%)	9 (8.2%)	
Stop smoking	0 (0.0%)	1 (2.6%)	2 (7.4%)	3 (2.7%)	
Current smoker	0 (0.0%)	0 (0.0%)	1 (3.7%)	1 (0.9%)	
<b>Smoking index</b>					
Mild	1 (50%)	0 (0.0%)	2 (40%)	3 (37.5%)	0.797
Moderate	0 (0.0%)	0 (0.0%)	1 (20%)	1 (12.5%)	
Heavy	1 (50%)	1 (100%)	2 (40%)	4 (50%)	

**Table(6)Relation between demographic data and adherence pattern in COPD patients already on therapy (n=130)**

<b>Variables</b>	<b>Good</b>	<b>Intermediate</b>	<b>Poor</b>	<b>Total</b>	<b>P value</b>
<b>Age/year</b> Mean $\pm$ SD Median (range)	60.89 $\pm$ 9.56 61 (35-78)	62.42 $\pm$ 11.93 60 (35-89)	66.25 $\pm$ 10.95 65 (49-85)	62.48 $\pm$ 11.07 61 (35-89)	0.198
<b>Gender:</b> Males Females	40 (88.9%) 5 (11.1%)	55 (84.6%) 10 (15.4%)	13 (65%) 7 (35%)	108 (83.1%) 22 (16.9%)	0.054
<b>Residence</b> Rural Urban	32 (71.1%) 13 (28.9%)	37 (56.9%) 28 (43.1%)	14 (70%) 6 (30%)	83 (63.8%) 47 (36.2%)	0.258
<b>Educational level</b> Illiterate Primary Secondary Graduate Postgraduate	 31 (68.9%) 5 (11.1%) 4 (8.9%) 2 (4.4%) 3 (6.7%)	 54 (83.1%) 7 (10.8%) 3 (4.6%) 0 (0.0%) 1 (1.5%)	 18 (90%) 2 (10%) 0 (0.0%) 0 (0.0%) 0 (0.0%)	 103 (79.2%) 14 (10.8%) 7 (5.4%) 2 (1.5%) 4 (3.1%)	0.266
<b>Socioeconomic status</b> Low Middle High	 12 (26.7%) 29 (64.4%) 4 (8.9%)	 7 (10.8%) 58 (89.2%) 0 (0.0%)	 4 (20%) 16 (80%) 0 (0.0%)	 23 (17.7%) 103 (79.2%) 4 (3.1%)	0.009
<b>Smoking status</b> Non Ex-smoker Stop smoking Current smoker	 6 (13.3%) 29 (64.4%) 6 (13.3%) 4 (8.9%)	 11 (16.9%) 46 (70.8%) 3 (4.6%) 5 (7.7%)	 7 (35%) 7 (35%) 2 (10%) 4 (20%)	 24 (18.4%) 82 (63.1%) 11 (8.5%) 13 (10%)	0.07
<b>Smoking index</b> Mild Moderate Heavy	 17 (58.7%) 3 (10.3%) 9 (31%)	 38 (79.2%) 0 (0.0%) 10 (20.8%)	 10 (90.9%) 0 (0.0%) 1 (9.1%)	 65 (73.9%) 3 (3.4%) 20 (22.7%)	0.05

**Table (7): Relation between demographic data and adherence pattern in COPD naïve patients (N=55)**

Variables	Good	Poor	Total	P value
<b>Age/year</b> Mean $\pm$ SD Median (range)	67.44 $\pm$ 7.09 65 (57-80)	63.33 $\pm$ 9.95 62 (45-95)	64 $\pm$ 9.61 65 (45-95)	0.234
<b>Gender</b> Males Females	6 (66.7%) 3 (33.3%)	33 (71.7%) 13 (28.3%)	39 (70.9%) 16 (29.1%)	0.71
<b>Residence</b> Rural Urban	1 (11.1%) 8 (88.9%)	29 (63%) 17 (37%)	30 (54.5%) 25 (45.5%)	0.008
<b>Educational level</b> Illiterate Primary Secondary Postgraduate	8 (88.9%) 0 (0.0%) 0 (0.0%) 1 (11.1%)	44 (95.6%) 1 (2.2%) 1 (2.2%) 0 (0.0%)	52 (94.5%) 1 (1.8%) 1 (1.8%) 1 (1.8%)	0.136
<b>Socioeconomic status</b> Low Middle High	1 (11.1%) 7 (77.8%) 1 (11.1%)	9 (19.6%) 37 (80.4%) 0 (0.0%)	10 (18.2%) 44 (80%) 1 (1.8%)	0.067
<b>Smoking status</b> Non Ex-smoker Stop smoking Current smoker	3 (33.3%) 2 (22.3%) 3 (33.3%) 1 (11.1%)	13 (28.3%) 19 (41.3%) 4 (8.7%) 10 (21.7%)	16 (29.1%) 21 (38.2%) 7 (12.7%) 11 (20%)	0.187

**Table(8)Relation between adherence pattern and type of disease (351)**

Parameter	Type of disease		Total	P-value
	Asthma	COPD		
<b>Good</b>	70 (42.2%)	54 (29.2%)	124 (35.3%)	0.013
<b>Intermediate</b>	38 (22.9%)	65 (35.1%)	103 (29.4%)	
<b>Poor</b>	58 (34.9%)	66 (35.7%)	124 (35.3%)	
<b>Total</b>	166 (100%)	185 (100%)	351 (100%)	

**Table (9)Relation between disease characteristics and adherence pattern in COPD patients already on therapy**

Variables	Good	Intermediate	Poor	Total	P value
<b>Duration of disease/ year</b> Mean $\pm$ SD Median (range)	12.48 $\pm$ 11.08 10 (1-50)	12.76 $\pm$ 6.53 13 (2-35)	13.55 $\pm$ 5.63 15 (4-20)	12.79 $\pm$ 8.24 11.5 (1-50)	0.13
<b>Number of emergency visit in the last year</b> < 2 visits 2-4 visits	33 (73.3%) 12 (26.7%)	58 (89.2%) 7 (10.8%)	19 (95%) 1 (5%)	110 (84.6%) 20 (15.4%)	0.028

**Table (10): Relation between adherence pattern and comorbidities.**

Parameter	Adherence			Total	P-value
	Good	Intermediate	Poor		
<b>D.M</b> No Yes	102 (82.3%) 22 (17.7%)	90 (87.4%) 13 (12.6%)	110 (88.7%) 14 (11.3%)	302 (86%) 49 (14%)	0.306
<b>HTN</b> No Yes	93 (75%) 31 (25%)	82 (79.6%) 21 (20.4%)	95 (76.6%) 29 (23.4%)	270 (76.9%) 81 (23.1%)	0.71
<b>ENT diseases</b> No Yes	91 (73.4%) 33 (26.6%)	89 (86.4%) 14 (13.6%)	94 (75.8%) 30 (24.2%)	274 (78.1%) 77 (21.9%)	0.046*
<b>GIT diseases</b> No Yes	110 (88.7%) 14 (11.3%)	92 (89.3%) 11 (10.7%)	115 (92.7%) 9 (7.3%)	317 (90.3%) 34 (9.7%)	0.518
<b>Cardiac diseases</b> No Yes	107 (86.3%) 17 (13.7%)	75 (72.8%) 28 (27.2%)	94 (75.8%) 30 (24.2%)	276 (78.6%) 75 (21.4%)	0.03*
<b>Renal diseases</b> No Yes	119 (96%) 5 (4%)	102 (99%) 1 (1%)	119 (96%) 5 (4%)	340 (96.9%) 11 (3.1%)	0.325
<b>Eye diseases</b> No Yes	113(91.1%) 11 (8.9%)	99 (96.1%) 4 (3.9%)	118 (95.2%) 6 (4.8%)	330 (94%) 21 (6%)	0.231
<b>Thyroid diseases</b> No Yes	120 (96.8%) 4 (3.2%)	103 (100%) 0 (0.0%)	122 (98.4%) 2 (1.6%)	345 (98.3%) 6 (1.7%)	0.174
<b>OSA</b> No Yes	124 (100%) 0 (0.0%)	103 (100%) 0 (0.0%)	122 (98.4%) 2 (1.6%)	349 (99.4%) 2 (0.6%)	0.159
<b>Vascular diseases</b> No Yes	124 (100%) 0 (0.0%)	101(98.1%) 2 (1.9%)	124 (100%) 0 (0.0%)	349 (99.4%) 2 (0.6%)	0.089
<b>Scoliosis:</b> No Yes	123 (99.2%) 26 (0.8%)	102 (99%) 1 (1%)	124 (100%) 0 (0.0%)	349 (99.4%) 2 (0.6%)	0.57
<b>Allergic dermatitis</b> No Yes	124 (100%) 0 (0.0%)	103 (100%) 0 (0.0%)	123 (99.2%) 26 (0.8%)	350 (99.7%) 1 (0.3%)	0.399
<b>Rheumatoid arthritis</b> No Yes	123 (99.2%) 26 (0.8%)	103 (100%) 0 (0.0%)	124 (100%) 0 (0.0%)	350 (99.7%) 1 (0.3%)	0.399
<b>CVS stroke</b> No Yes	124 (100%) 0 (0.0%)	102 (99%) 1 (1%)	122 (98.4%) 2 (1.6%)	348 (99.1%) 3 (0.9%)	0.382

**DM:** diabetes mellitus    **HTN:** hyupertension**OSA:** obstructive sleep apnea    **CVS:**cerbrovascular stroke

**Table(11)Relation between drug characteristics and adherence pattern in asthmatic patients already on therapy (n=110)**

Variables	Good	Intermediate	Poor	Total	P value
<b>Frequency of inhaler administration</b>					
Once	0 (0.0%)	2 (5.3%)	1 (3.7%)	3 (2.7%)	<0.001
Twice	40 (88.9%)	32 (84.2%)	11 (40.7%)	83 (75.5%)	
on need	5 (11.1%)	4 (10.5%)	15 (55.6%)	24 (21.8%)	
<b>Onset of action of inhaler</b>					
<5-20 minutes	13 (28.9%)	19 (50%)	4 (14.8%)	36 (32.7%)	0.002
5 minutes	13 (28.9%)	8 (21.1%)	15 (55.6%)	36 (32.7%)	
20 minutes	0 (0.0%)	0 (0.0%)	2 (7.4%)	2 (1.9%)	
30 minutes	19 (42.2%)	11 (28.9%)	6 (22.2%)	36 (32.7%)	
<b>Type of device</b>					
Aerolizer	20 (44.5%)	13 (34.2%)	4 (14.8%)	37 (33.6%)	0.001
pMDI	5 (11.1%)	4 (10.6%)	14 (51.9%)	23 (20.9%)	
Turbohaler	14 (31.1%)	19 (50.0%)	5 (18.5%)	38 (34.5%)	
Handihaler	0 (0.0%)	1 (2.6%)	1 (3.7%)	2 (1.8%)	
Diskus	4 (8.9%)	1 (2.6%)	2 (7.4%)	7 (6.4%)	
Breezhaler	0 (0.0%)	0 (0.0%)	1 (3.7%)	1 (0.9%)	
Evohaler	2 (4.4%)	0 (0.0%)	0 (0.0%)	2 (1.8%)	
<b>Type of drug</b>					
Budesonide	15 (33.4%)	9 (23.8%)	3 (11.1%)	27 (24.5%)	0.001
Formetrol	6 (13.3%)	4 (10.5%)	1 (3.7%)	11 (10%)	
Salbutamol	5 (11.1%)	4 (10.5%)	14 (51.9%)	23 (20.9%)	
Budesonide formetrol	13 (28.9%)	19 (50%)	5 (18.5%)	37 (33.6%)	
Fluticasone	6 (13.3%)	1 (2.6%)	1 (3.7%)	8 (7.3%)	
salmeterol	0 (0.0%)	0 (0.0%)	1 (3.7%)	1 (0.9%)	
Glycopyrinum bromide	0 (0.0%)	1 (2.6%)	1 (3.7%)	2 (1.8%)	
Tiotropium	0 (0.0%)	0 (0.0%)	1 (3.7%)	1 (0.9%)	
Ipratropium					

**N.B:**Number of drug used more than patients as some patients use more than one drug **MDI:** metered dose inhaler

**Table(12)Relation between drug characteristics and adherence pattern in COPD patients already on therapy (n=130)**

Variables	Good	Intermediate	Poor	Total	P value
<b>Frequency of inhaler administration</b>					
Once	11(24.4%)	18 (27.7%)	4 (20%)	33 (25.4%)	0.003
Twice	29 (64.5%)	45 (69.2%)	9 (45%)	83 (63.8%)	
on need	5 (11.1%)	2 (3.1%)	7 (35%)	14 (10.8%)	
<b>Onset of action of inhaler</b>					
<5-20 minutes	5 (11.1%)	6 (9.2%)	0(0.0%)	11 (8.4%)	0.622
5 minutes	23 (51.1%)	35 (53.9%)	11 (55%)	69 (53.1%)	
20 minutes	1 (2.2%)	0(0.0%)	0(0.0%)	1(0.8%)	
30 minutes	16 (35.6%)	24 (36.9%)	9 (45%)	49 (37.7%)	
<b>Type of device</b>					
Aerolizer	25 (55.6%)	35 (53.8%)	6 (30%)	66 (50.8%)	0.008
MDI	6 (13.3%)	2 (3.1%)	8 (40%)	16 (12.3%)	
Turbohaler	5 (11.1%)	7 (10.9%)	0(0.0%)	12 (9.2%)	
Handihaler	5 (11.1%)	11 (16.9%)	4 (20%)	20 (15.4%)	
Diskus	1 (2.2%)	3 (4.6%)	2 (10%)	6 (4.6%)	
Breezhaler	3 (6.7%)	6 (9.2%)	0(0.0%)	9 (6.9%)	
Respimat	0(0.0%)	1 (1.5%)	0(0.0%)	1 (0.8%)	
<b>Type of drug</b>					
Budesonide	8 (17.8%)	6 (9.2%)	3 (15%)	17 (13.1%)	0.034
Formetrol	17 (37.8%)	29 (44.6%)	3 (15%)	49 (37.7%)	
Salbutamol	4 (8.9%)	2 (3.1%)	7 (35%)	13 (10%)	
Budesonide formetrol	5 (11.1%)	7 (10.8%)	0(0.0%)	12 (9.2%)	
Fluticasone salmetrol	1 (2.2%)	3 (4.6%)	2 (10%)	6 (4.6%)	
Glycopyrinum bromide	2 (4.4%)	3 (4.6%)	0(0.0%)	5 (3.8%)	
Tiotropium	5 (11.1%)	12 (18.5%)	4 (20%)	21 (16.2%)	
Ipratropium	1 (2.2%)	0(0.0%)	0(0.0%)	1(0.8%)	
Formetrolbeclomethason	1 (2.2%)	0(0.0%)	1 (5%)	2(1.5%)	
e	0(0.0%)	1 (1.5%)	0(0.0%)	1 (0.8%)	
Indicatrol	1 (2.2%)	2 (3.1%)	0(0.0%)	3 (2.3%)	
Indicatrolglycopyrinum					