

INTRODUCTION

Chronic cough continues to be a significant medical issue for patients in all states of health. While prior studies demonstrate that chronic cough diminishes quality of life, its specific impact on sleep has not been well characterized. Cough may impact sleep and many of these patients report sleep disturbances caused by recurrent episodes of coughing. The primary goal of this study was to investigate the relationship between chronic cough severity and daytime sleepiness.

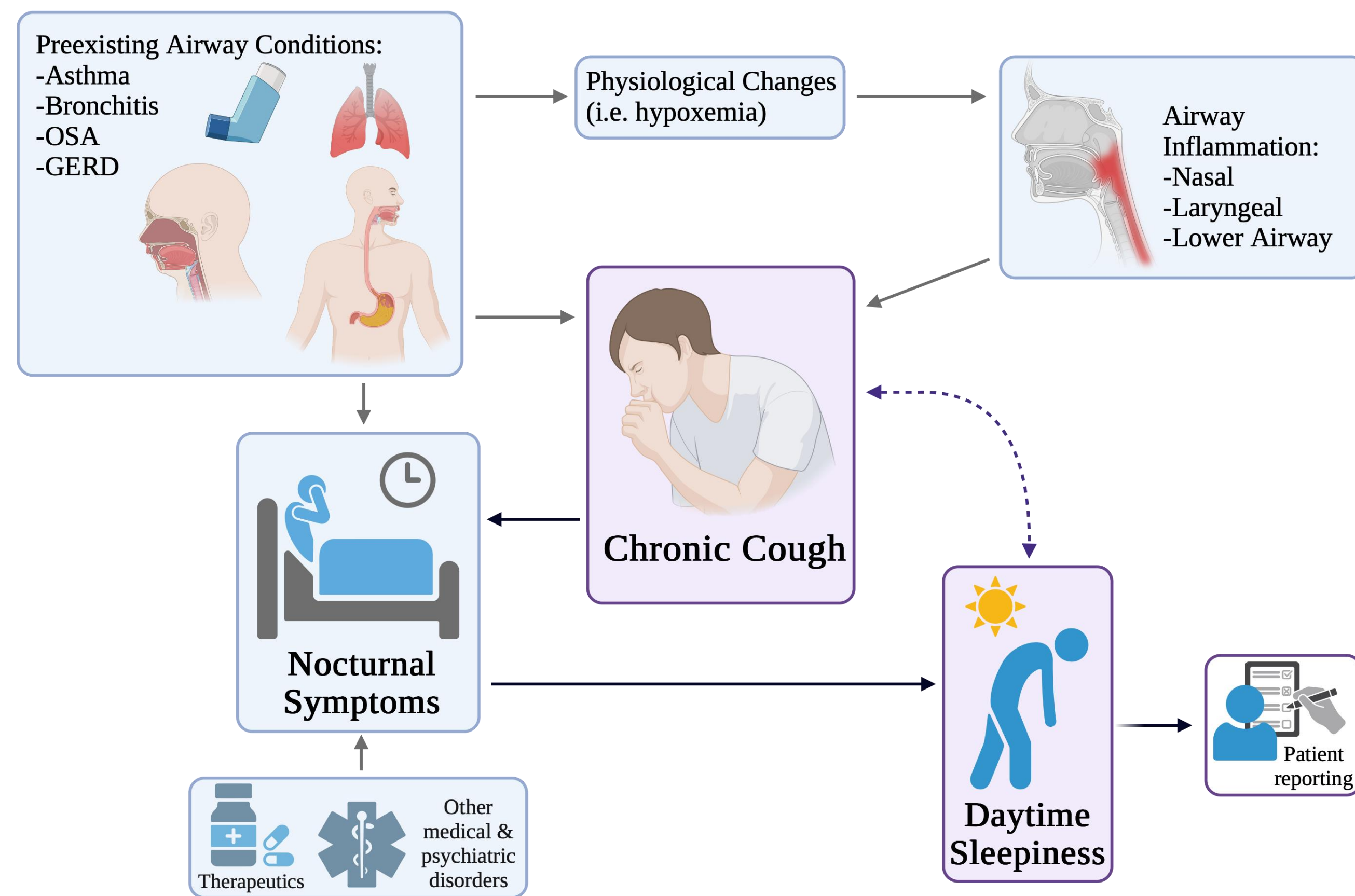


Figure 1. Graphical summary. The main factors influencing chronic cough have been highlighted blue and the factors investigated in this study are highlighted purple. Study done using patient reported outcomes.

METHODS

Inclusion criteria included individuals over 18 years of age who presented to the University of Washington Laryngology clinic with the chief complaint of chronic cough. Patients with obstructive sleep apnea were included, however this diagnosis and compliance with treatment were recorded. At the time of enrollment, patients completed the Cough Severity Index (CSI), Epworth Sleepiness Scale (ESS).

Full Cohort Study	
Demographics	N=20
Age	
Median [IQR]	67.000 [55.750, 73.500]
Range	28.000 - 83.000
Sex	
Female	13 (65.000%)
Male	7 (35.000%)
Smoking Status	
F	3 (15.000%)
N	17 (85.000%)
BMI	
Median [IQR]	25.840 [23.590, 30.325]
Range	17.890 - 34.100
Previous Laryngeal Surgery	
N	19 (95.000%)
Y	1 (5.000%)

Figure 2. Demographic summary table of study participants. Continuous variables were summarized with the median and interquartile range and categorical variables were summarized using frequency counts and percentages.

RESULTS

Twenty patients participated in this prospective cross-sectional study. The median CSI was 16.00 [IQR 3.75-24.0] and the median ESS was 5.0 [IQR 2.75-9.5], which is within the range of normal daytime sleepiness. The correlation between ESS and CSI was 0.380, indicating mild to moderate correlation. The correlation between age and ESS was -0.5 and between age and CSI was -0.51 indicating moderate correlation. Given the small sample size, confidence intervals and p values were not included.

Characteristic	N=20
DX Chronic Cough (1) or Throat Clearing (2)	
1	13 (65.000%)
1&2	7 (35.000%)
Epworth Sleepiness Scale Total	
Median [IQR]	5.000 [2.750, 9.500]
Range	0.000 - 19.000
Cough Severity Index Total	
Median [IQR]	16.000 [3.750, 24.000]
Range	0.000 - 30.000
Voice Handicap Index Total	
Median [IQR]	4.000 [0.750, 7.000]
Range	0.000 - 30.000
EAT-10 Total	
Median [IQR]	2.000 [0.750, 4.500]
Range	0.000 - 23.000
RSI Total	
Median [IQR]	18.500 [10.750, 25.500]
Range	2.000 - 35.000
Dyspnea Index Total	
Median [IQR]	0.500 [0.000, 8.250]
Range	0.000 - 33.000

Figure 3. Characteristic summary table of study participants. Continuous variables were summarized with the median and interquartile range and categorical variables were summarized using frequency counts and percentages.

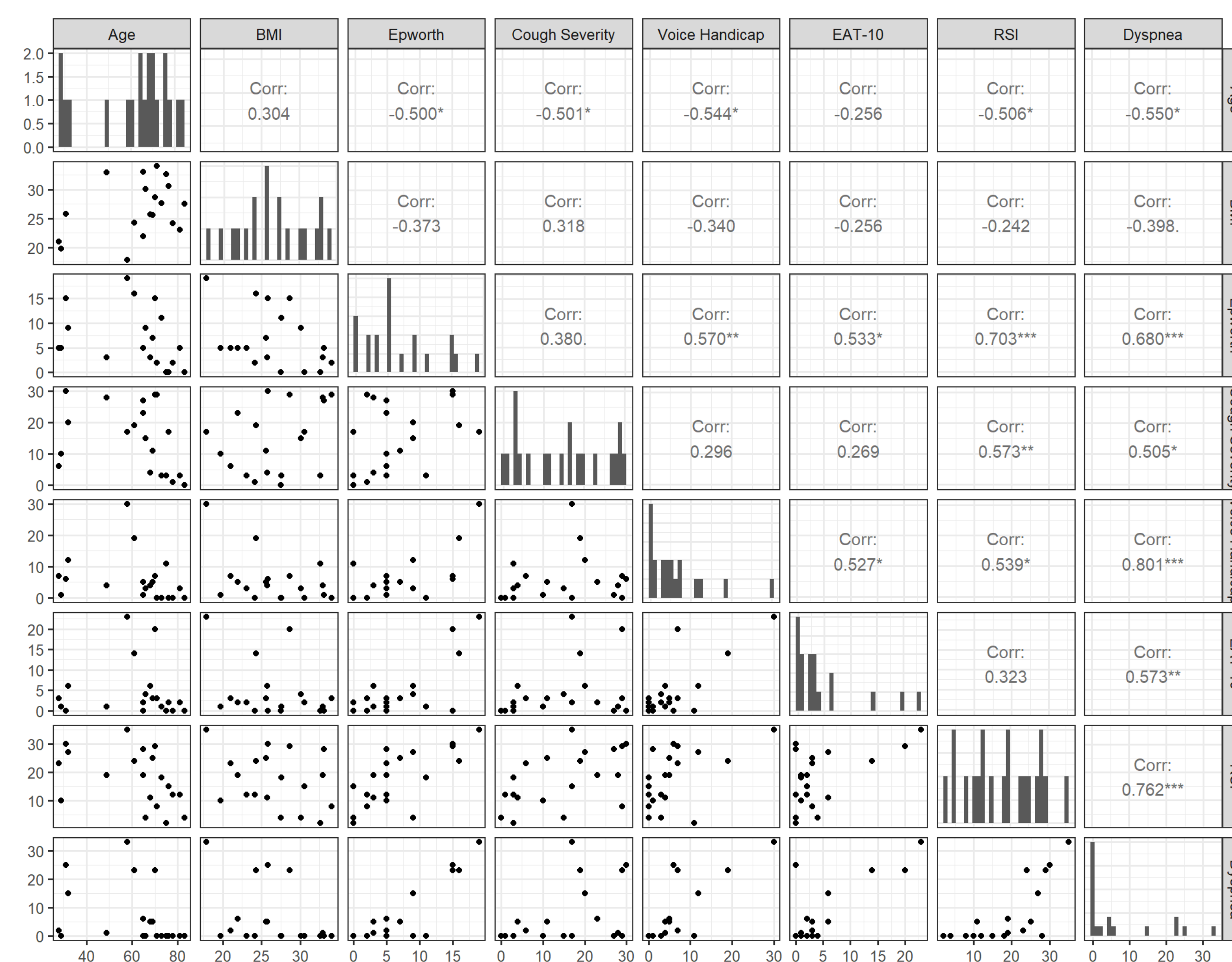


Figure 5. For all continuous variables: 1) bivariate scatterplots for all pairs of variables, 2) univariate histograms with density curves for all variables, and 3) Spearman's rho rank-based correlation coefficient for all pairs of variables. All statistical tests were two-sided, and statistical significance was defined as p-value ≤ 0.05 .

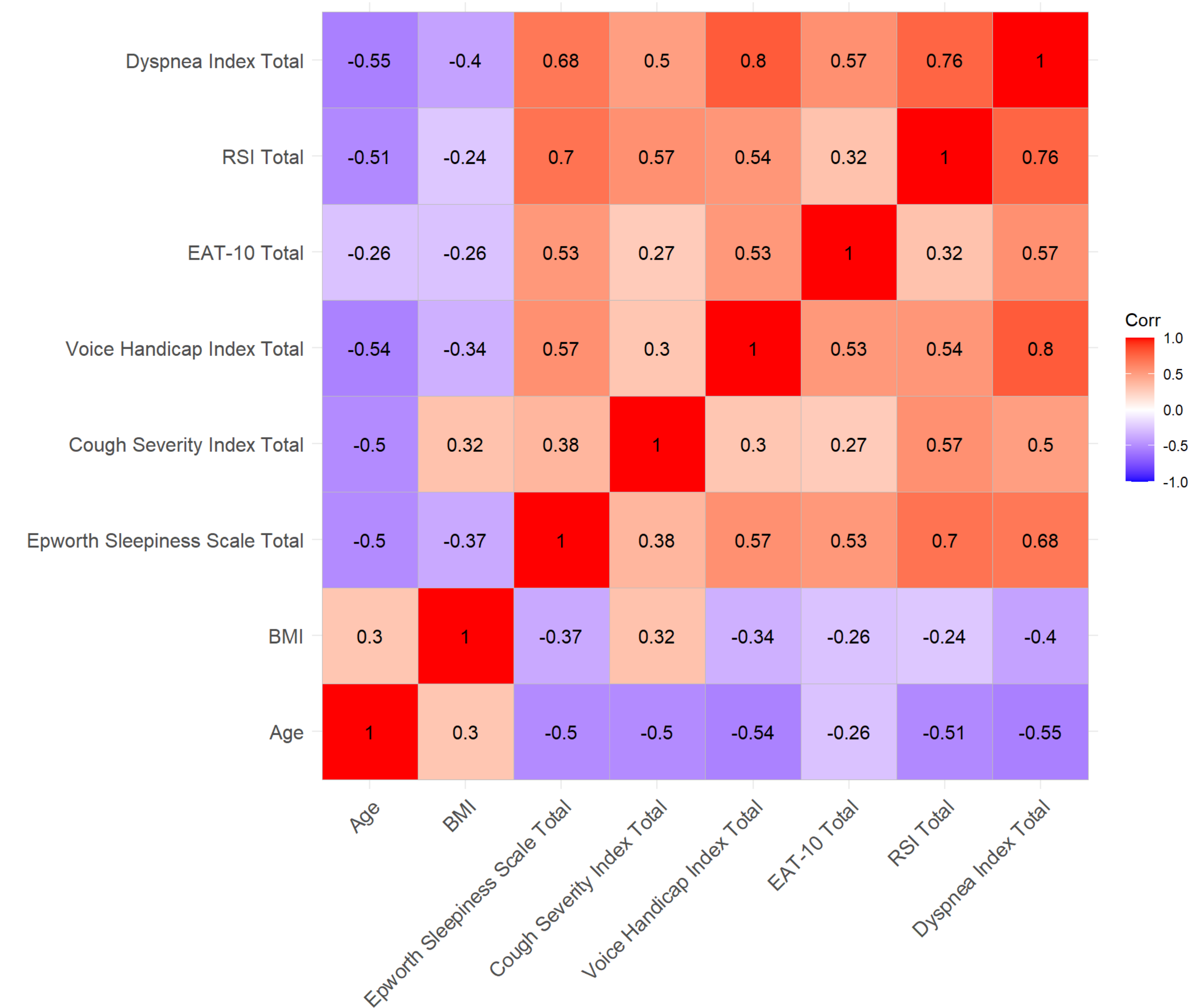


Figure 4. Heatmap of Spearman's Rho Correlation Coefficient. Significant testing is not recommended due to the small sample size; however, the correlation coefficients can be considered as qualitative indicators without significance testing.

CONCLUSION

There was a mild to moderate correlation between patient-reported cough severity and ESS scores. While causation cannot be determined from this study, it is possible that sleep-time coughing may lead to increased daytime sleepiness. Additional studies are needed to elucidate possible directionality of the correlation. Further direction may explore if sleep disruption responds to treatment of the underlying cough.

DISCUSSION

This study explores the possibility that nighttime coughing may impair sleep quality by highlighting a possible connection between chronic cough and daytime sleepiness and fatigue. The results demonstrate the need for larger sample sizes, even with the observed mild to moderate correlation. The study is ongoing to increase the dataset, evaluate more sleep-related factors, and the impact of cough treatment on sleep.

ACKNOWLEDGMENTS

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