Normality for each analysis was assessed using Shapiro-Wilks tests.

For the one-way ANOVA assessing BMI, normality was violated for the measure BMI in the sleep fragmentation group ($p=0.038$).

For the one-way ANOVA assessing differences in sleep parameters between groups on the adaptation session, normality was violated for sleep efficiency in the sleep deprivation group ($p=0.021$).

For the two- way mixed ANOVA (group by session) assessing differences in baseline respiratory and muscle parameters on the control and adaptation sessions, normality was violated for V_I in the sleep deprivation group during the experimental session ($p=0.046$) and for peak $EMG_{GG\ in}$ the sleep deprivation group on the adaptation session ($p=0.027$).

Normality violations for the three-way mixed ANOVA (group x session x load condition – pre-load, 10cmH_2O load and 20cmH_2O load) are shown in table E1. Note that for each measure (V_I, T_I/T_{TOT}, PIF, Pmask, peak EMG_{GG} and tonic EMG_{GG}) there were 18 levels at which Shapiro-Wilks was performed to assess normality. Levels comprised combinations of group (control vs. deprivation vs. fragmentation), session (baseline vs. experimental) and load condition (pre-load vs. 10cmH_2O load vs. 20cmH_2O load). Therefore 108 combinations were assessed for normality. Normality was violated on 7 of these occasions. As these violations were infrequent and the sample size was small preventing useful transformation, no corrections were made.

Table S1 – Normality violations for V_I, T_I/T_{TOT}, PIF, Pmask, peak EMG_{GG} and Tonic EMG_{GG} for each group on baseline and experimental sessions of resistive load testing.

Measure	Group	Session	Load	P-value
V_I	Fragmentation	Experimental	20cmH_2O	0.015
T_I/T_{TOT}	N/A	N/A	N/A	N/A
PIF	Control	Adaptation	Pre-load	0.035
	Control	Adaptation	10cmH_2O	0.026
Pmask	N/A	N/A	N/A	N/A
Peak EMG_{GG}	N/A	N/A	N/A	N/A
Tonic EMG_{GG}	Deprivation	Adaptation	Pre-load	0.036
	Deprivation	Experimental	Pre-load	0.032
	Deprivation	Experimental	10cmH_2O	0.029
	Control	Experimental	20cmH2o	0.044

Note: N/A means there were no violations for that measure. As shown there were 7 violations out of a potential 108 violations.