Randomization assessment

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21 September 2023

1 Traditional method

Table 1: Differences in means across Maropitant and Metadone

	Metadone(control)	Maropitant(treatment)	p-value
Age	15.9	16.95	.4321982
Weight	19.95	20.85	.2792915

The table displays the means of two key variables, 'Age' and 'Weight,' stratified by treatment status. The p-values in the last column correspond to the results of t-tests comparing the means of these variables between the treatment and control groups.

Notably, the p-values for both 'Age' and 'Weight' are relatively large, with 'Age' yielding a p-value of approximately 0.4322 and 'Weight' yielding a p-value of around 0.2793. These large p-values are indicative of the success of the randomization process. In the context of this experiment, larger p-values suggest that there are no statistically significant differences in these key characteristics between the treatment and control groups. This reinforces our confidence in the randomization process, indicating that it effectively balanced these variables across the two groups, thereby enhancing the validity of our experimental findings.

The results of the probit regression provide important evidence supporting the success of our randomization process. The coefficient estimates for 'Age' and 'Weight,' which represent potential confounding variables, do not show statistically significant relationships with the treatment variable 'Maropitant.' Additionally, the likelihood ratio (LR) chi-squared test, which assesses the overall significance of the covariates, yields a p-value of 0.3549, indicating that these covariates collectively do not significantly predict the treatment assignment. This suggests that the randomization process effectively balanced these characteristics between the treatment and control groups, reinforcing our confidence in the experiment's validity.

Table 2: Regression probit to check randomization

	Maropitant
Age	0.045
	(0.050)
Weight	0.094
	(0.080)
Constant	-2.662
	(1.915)
Observations	40
LR chi2(2)	2.07
Prob > chi2	0.3549

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

1.1 Plots

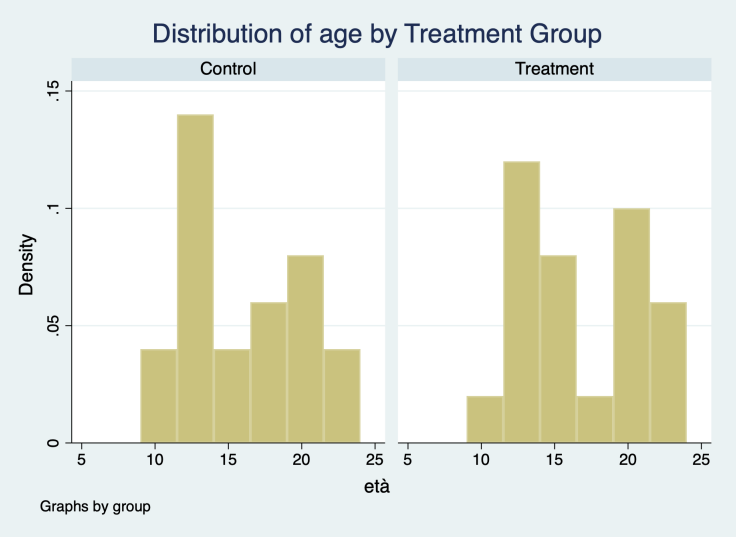

Figure 1: Histogram of age by Treatment Group

Investigating the randomization success of our experiment, we turn our attention to the provided plots. These visual representations showcase the distribution of key variables among the treatment and control groups. Notably, the plots reveal a striking similarity in the distribution of variables between the two

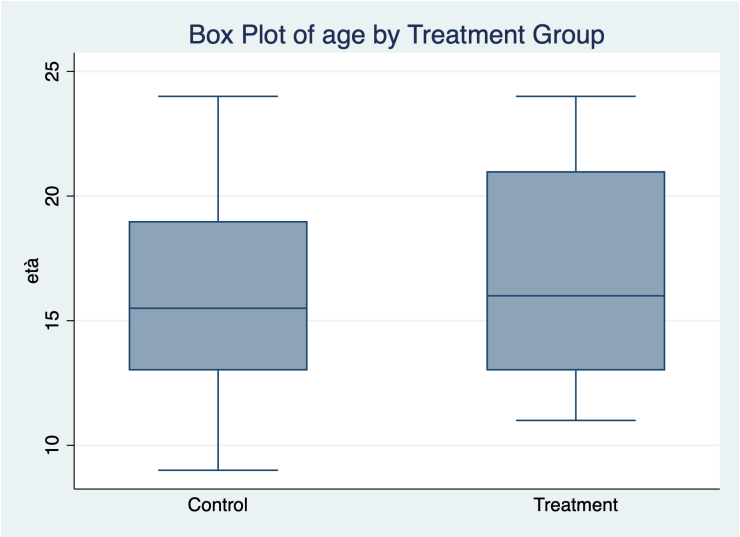

Figure 2: Box Plot of age by Treatment Group

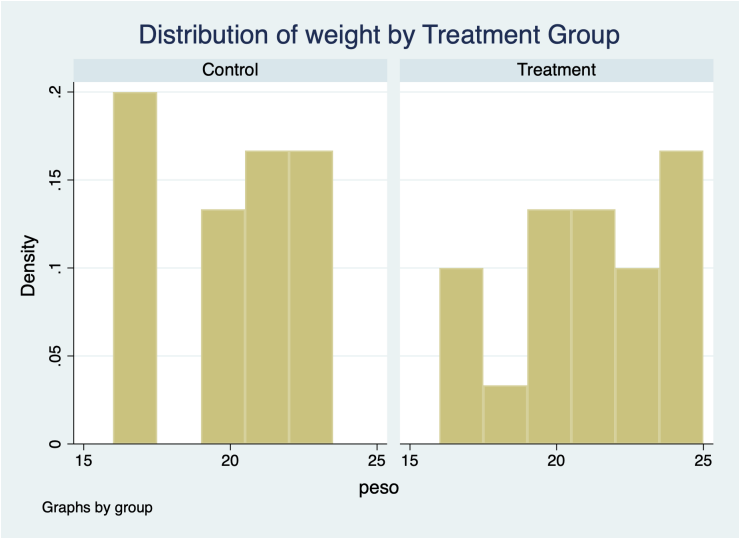

Figure 3: Histogram of weight by Treatment Group

groups, with substantial overlap observed. This alignment suggests that the randomization process effectively balanced the covariates, ensuring that both groups exhibit comparable characteristics. The absence of pronounced differences between the treatment and control groups in these plots reinforces our confidence in the validity of the randomization procedure, strengthening the

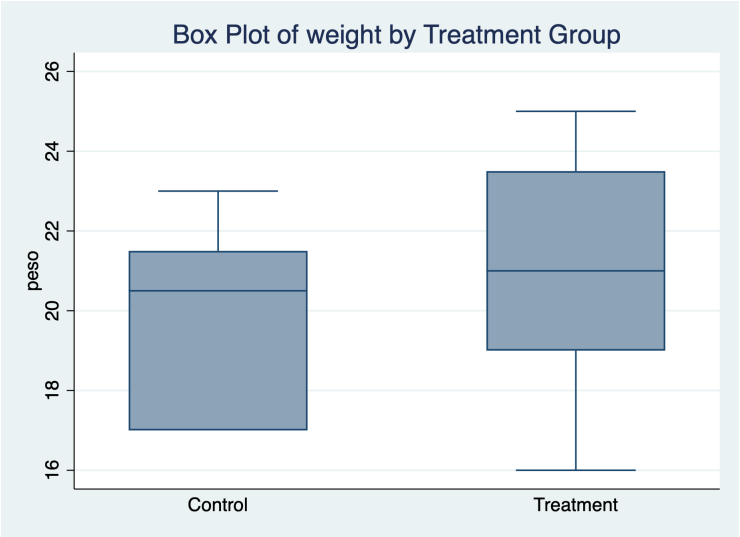

Figure 4: Box Plot of weight by Treatment Group

foundation upon which our experimental conclusions are built.

2 Thunder method

Table 3: Mean Values by Treatment Group (Thunder Method)

	Metadone (control)	Maropitant (treatment)	p-value
Age	15.05	16.00	0.4516
Weight	19.00	20.00	0.2429

The table presents the means of two key variables, 'Age' and 'Weight,' categorized by treatment group. The p-values in the last column represent the outcomes of t-tests that compare the means of these variables between the treatment and control groups.

Notably, the p-values for both 'Age' and 'Weight' are relatively large, with 'Age' yielding a p-value of approximately 0.4516 and 'Weight' yielding a p-value of approximately 0.2429. These sizable p-values serve as strong evidence in favor of the successful implementation of the randomization process. Within the context of this experiment, larger p-values suggest that there are no statistically significant disparities in these crucial characteristics between the treatment and control groups. This reaffirms our confidence in the effectiveness of the randomization process, as it has effectively balanced these variables between the two groups, thereby bolstering the credibility of our experimental results.

Table 4: Probit Regression to Check Randomization

	Maropitant
Age	0.048
	(0.053)
Weight	0.100
	(0.078)
Constant	-2.682
	(1.836)
Observations	40
LR chi2(2)	2.27
Prob > chi2	0.3220

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

The results of the probit regression provide important evidence supporting the success of our randomization process. The coefficient estimates for 'Age' and 'Weight,' which represent potential confounding variables, do not show statistically significant relationships with the treatment variable 'Maropitant.' Additionally, the likelihood ratio (LR) chi-squared test, which assesses the overall significance of the covariates, yields a p-value of 0.3549, indicating that these covariates collectively do not significantly predict the treatment assignment. This suggests that the randomization process effectively balanced these characteristics between the treatment and control groups, reinforcing our confidence in the experiment's validity.

2.1 Plots

These graphical representations offer valuable insights into the distribution of key variables between the control (Metadone) and treatment (Maropitant) groups. Remarkably, the plots depict a high degree of similarity in the distribution patterns of these variables across both groups. The substantial overlap observed in the plots suggests that the randomization procedure has achieved a successful balance of covariates between the treatment and control groups. This harmonious alignment in the plots serves as compelling evidence of the randomization's success, enhancing the credibility of our experimental findings. It indicates that any observed effects are likely attributable to the treatment rather than confounding variables, reinforcing the robustness of our conclusions.

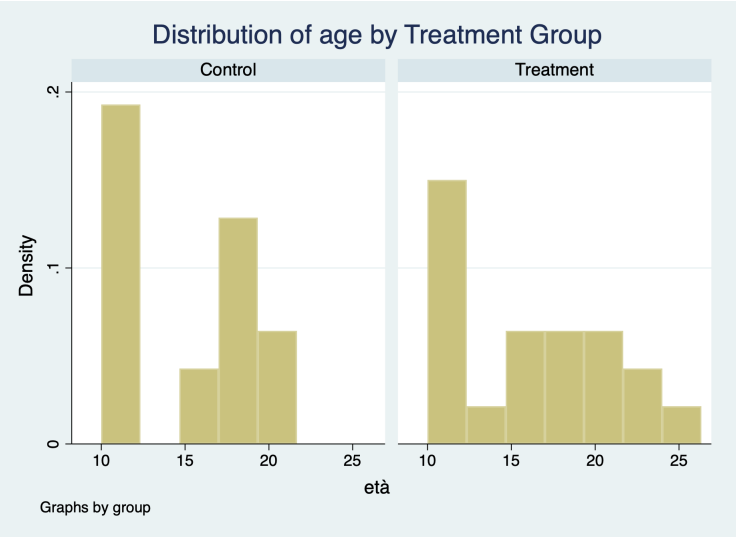

Figure 5: Histogram of age by Treatment Group

2.2 Regression results

Table 5: Regression

	(1) freq_card_0	(2) freq_resp_0	(3) freq_card_1	(4) freq_resp_1	(5) freq_card_
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	-1.871	-1.198	-1.026	-0.036	0.420
	(3.908)	(0.933)	(1.507)	(0.508)	(0.583)
Maropitant=1 × thunderbeat=0	3.235	1.468	7.558***	1.690***	1.451**
	(3.911)	(0.934)	(1.508)	(0.509)	(0.583)
Maropitant=1 × thunderbeat=1	1.282	0.937	6.548***	1.787***	2.466***
	(3.860)	(0.922)	(1.488)	(0.502)	(0.576)
weight	-0.334	-0.358***	-0.089	0.197***	-0.076
	(0.535)	(0.128)	(0.206)	(0.070)	(0.080)
age	-0.652*	-0.186**	0.069	0.031	-0.126**
	(0.346)	(0.083)	(0.133)	(0.045)	(0.052)
Constant	118.025***	34.100***	53.686***	7.374***	15.077***
	(12.775)	(3.051)	(4.926)	(1.662)	(1.905)
Observations	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Regression

	(1) etco_3	(2) freq_card_3	(3) freq_resp_3	(4) vap_3	(5) PAS_3	(6) PAD_
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	0.026	-0.878	-0.072	-0.028	-0.814	-0.56
	(0.786)	(1.961)	(0.669)	(0.046)	(2.540)	(2.259
Maropitant=1 × thunderbeat=0	-6.381***	10.661***	1.848***	-0.021	15.355***	9.938*
	(0.787)	(1.962)	(0.669)	(0.047)	(2.542)	(2.261
Maropitant=1 × thunderbeat=1	-6.496***	9.750***	2.096***	-0.048	16.071***	10.641
	(0.777)	(1.937)	(0.660)	(0.046)	(2.509)	(2.231
weight	-0.080	0.227	-0.106	-0.018***	-0.012	-0.08
	(0.108)	(0.268)	(0.092)	(0.006)	(0.348)	(0.309
age	0.003	-0.110	0.093	-0.013***	0.292	0.129
	(0.070)	(0.174)	(0.059)	(0.004)	(0.225)	(0.200
Constant	48.507***	49.468***	10.737***	8.557***	99.157***	68.070
	(2.571)	(6.410)	(2.186)	(0.152)	(8.303)	(7.386
Observations	80	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Regression

	(1) etco_4	(2) freq_resp_4	(3) alog_4	(4) alog_MAC_4	(5) vap_4	(6) PAS_
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	-0.682	-0.209	0.002	0.000	0.063	-2.02
	(0.519)	(0.620)	(0.016)	(0.002)	(0.153)	(2.257
Maropitant=1 × thunderbeat=0	-4.765***	2.116***	0.004	0.000	-0.069	15.184
	(0.520)	(0.621)	(0.016)	(0.002)	(0.154)	(2.258
Maropitant=1 × thunderbeat=1	-4.804***	2.012***	0.005	0.001	-0.005	13.581
	(0.513)	(0.613)	(0.015)	(0.002)	(0.152)	(2.229
weight	0.070	-0.112	0.002	0.000	0.031	-0.34
	(0.071)	(0.085)	(0.002)	(0.000)	(0.021)	(0.309
age	0.001	-0.062	-0.000	-0.000	0.039***	0.359
	(0.046)	(0.055)	(0.001)	(0.000)	(0.014)	(0.200
Constant	42.573***	13.272***	5.461***	0.715***	5.357***	104.180
	(1.697)	(2.027)	(0.051)	(0.007)	(0.502)	(7.377
Observations	80	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Regression

	(1) etco_5	(2) freq_resp_5	(3) alog_5	(4) alog_MAC_5	(5) vap_5	(6) PAS_
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	-0.445	0.102	-0.196**	-0.026**	-0.040	0.811
	(0.457)	(0.548)	(0.078)	(0.010)	(0.154)	(2.002
Maropitant=1 × thunderbeat=0	-4.832***	2.027***	0.298***	0.039***	0.003	16.221
	(0.457)	(0.548)	(0.078)	(0.010)	(0.154)	(2.003
Maropitant=1 × thunderbeat=1	-4.845***	2.105***	0.104	0.014	-0.035	20.955
	(0.451)	(0.541)	(0.077)	(0.010)	(0.152)	(1.977
weight	0.086	-0.203***	-0.015	-0.002	0.026	-0.18
	(0.063)	(0.075)	(0.011)	(0.001)	(0.021)	(0.274
age	-0.091**	0.053	0.015**	0.002**	0.041***	0.043
	(0.040)	(0.048)	(0.007)	(0.001)	(0.014)	(0.177
Constant	43.774***	13.105***	5.425***	0.710***	5.529***	107.045
	(1.493)	(1.792)	(0.255)	(0.033)	(0.504)	(6.543
Observations	80	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Regression

	(1) etco_6	(2) freq_resp_6	(3) alog_6	(4) alog_MAC_6	(5) vap_6	(6) PAS_
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	0.00
	(.)	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	0.459	-1.051*	-0.215***	-0.028***	-0.187**	-2.48
	(0.437)	(0.594)	(0.056)	(0.007)	(0.074)	(2.07
Maropitant=1 × thunderbeat=0	-4.450***	2.443***	0.344***	0.045***	0.283***	15.927
	(0.437)	(0.595)	(0.056)	(0.007)	(0.074)	(2.08
Maropitant=1 × thunderbeat=1	-2.986***	1.608***	0.151***	0.020***	0.098	15.949
	(0.432)	(0.587)	(0.055)	(0.007)	(0.073)	(2.05
weight	-0.128**	-0.159*	-0.016**	-0.002**	-0.003	-0.38
	(0.060)	(0.081)	(0.008)	(0.001)	(0.010)	(0.28
age	-0.081**	0.000	0.001	0.000	0.019***	0.20
	(0.039)	(0.053)	(0.005)	(0.001)	(0.007)	(0.18
Constant	46.844***	13.566***	5.746***	0.752***	5.468***	114.68
	(1.429)	(1.942)	(0.182)	(0.024)	(0.241)	(6.79
Observations	80	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Regression

	(1) etco_7	(2) freq_resp_7	(3) alog_7	(4) alog_MAC_7	(5) vap_7	(6) PAS_
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	0.00
	(.)	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	-0.897*	1.061*	-0.208**	-0.027**	-0.224***	-4.21
	(0.453)	(0.562)	(0.093)	(0.012)	(0.078)	(2.13
Maropitant=1 × thunderbeat=0	-5.039***	1.980***	0.649***	0.085***	0.446***	19.750
	(0.453)	(0.563)	(0.093)	(0.012)	(0.078)	(2.13
Maropitant=1 × thunderbeat=1	-4.897***	-0.596	0.441***	0.058***	0.232***	17.439
	(0.447)	(0.556)	(0.092)	(0.012)	(0.077)	(2.10
weight	0.053	-0.108	-0.003	-0.000	-0.014	-0.30
	(0.062)	(0.077)	(0.013)	(0.002)	(0.011)	(0.29
age	-0.056	0.017	-0.006	-0.001	-0.013*	0.26
	(0.040)	(0.050)	(0.008)	(0.001)	(0.007)	(0.18
Constant	43.981***	11.896***	4.975***	0.651***	5.749***	104.27
	(1.480)	(1.839)	(0.304)	(0.040)	(0.256)	(6.97
Observations	80	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Regression

	(1) freq_card_8	(2) etco_8	(3) freq_resp_8	(4) alog_8	(5) alog_MAC_8	v
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	
	(.)	(.)	(.)	(.)	(.)	
Maropitant=0 × thunderbeat=1	-6.740***	-0.452	1.656***	-0.681***	-0.089***	
	(1.876)	(0.453)	(0.623)	(0.089)	(0.012)	(
Maropitant=1 × thunderbeat=0	9.960***	-4.737***	2.032***	0.332***	0.043***	0.
	(1.877)	(0.453)	(0.624)	(0.089)	(0.012)	(
Maropitant=1 × thunderbeat=1	4.506**	-4.344***	-0.393	-0.029	-0.004	-0
	(1.853)	(0.447)	(0.616)	(0.088)	(0.012)	(
weight	-0.272	-0.004	-0.168*	-0.003	-0.000	-
	(0.257)	(0.062)	(0.085)	(0.012)	(0.002)	(
age	0.081	-0.056	0.018	-0.009	-0.001	0
	(0.166)	(0.040)	(0.055)	(0.008)	(0.001)	(
Constant	81.691***	44.128***	13.508***	5.624***	0.736***	5.
	(6.132)	(1.481)	(2.038)	(0.292)	(0.038)	(
Observations	80	80	80	80	80	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Regression

	(1) freq_card_9	(2) etco_9	(3) freq_resp_9	(4) alog_9	(5) alog_MAC_9	va
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000	0
	(.)	(.)	(.)	(.)	(.)	
Maropitant=0 × thunderbeat=1	-1.924	0.177	-0.658	-0.143*	-0.019*	0
	(1.868)	(0.444)	(0.549)	(0.080)	(0.010)	(0
Maropitant=1 × thunderbeat=0	9.007***	-3.669***	1.696***	0.689***	0.090***	0.5
	(1.870)	(0.445)	(0.550)	(0.080)	(0.010)	(0
Maropitant=1 × thunderbeat=1	7.980***	-3.397***	1.204**	0.430***	0.056***	-0.
	(1.845)	(0.439)	(0.543)	(0.079)	(0.010)	(0
weight	-0.179	0.008	-0.138*	0.002	0.000	-0
	(0.256)	(0.061)	(0.075)	(0.011)	(0.001)	(0
age	0.289*	-0.036	0.026	-0.006	-0.001	-0
	(0.165)	(0.039)	(0.049)	(0.007)	(0.001)	(0
Constant	69.023***	43.420***	12.277***	4.819***	0.631***	5.3
	(6.108)	(1.452)	(1.796)	(0.261)	(0.034)	(0
Observations	80	80	80	80	80	

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Regression

	(1) freq_card_10	(2) etco_10	(3) freq_resp_10	(4) alog_10	(5) alog_MAC_10
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	-3.195*	-0.558	-0.816	-0.187**	-0.025**
	(1.776)	(0.486)	(0.562)	(0.079)	(0.010)
Maropitant=1 × thunderbeat=0	9.692***	-7.193***	1.679***	0.494***	0.065***
	(1.778)	(0.487)	(0.562)	(0.079)	(0.010)
Maropitant=1 × thunderbeat=1	8.099***	-7.743***	1.357**	0.296***	0.039***
	(1.755)	(0.480)	(0.555)	(0.078)	(0.010)
weight	-0.007	-0.094	-0.011	0.001	0.000
	(0.243)	(0.067)	(0.077)	(0.011)	(0.001)
age	0.014	-0.022	-0.066	-0.010	-0.001
	(0.157)	(0.043)	(0.050)	(0.007)	(0.001)
Constant	68.167***	48.772***	11.210***	4.416***	0.578***
	(5.807)	(1.590)	(1.837)	(0.257)	(0.034)
Observations	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Regression

	(1) freq_card_11	(2) etco_11	(3) freq_resp_11	(4) alog_11	(5) alog_MAC_11
Maropitant=0 × thunderbeat=0	0.000	0.000	0.000	0.000	0.000
	(.)	(.)	(.)	(.)	(.)
Maropitant=0 × thunderbeat=1	-3.766**	-1.276***	3.415***	-0.179***	-0.023***
	(1.688)	(0.467)	(0.535)	(0.066)	(0.009)
Maropitant=1 × thunderbeat=0	13.395***	-5.268***	2.475***	0.561***	0.073***
	(1.689)	(0.468)	(0.535)	(0.066)	(0.009)
Maropitant=1 × thunderbeat=1	14.193***	-5.157***	-0.053	0.551***	0.072***
	(1.667)	(0.462)	(0.528)	(0.066)	(0.009)
weight	-0.048	0.128**	-0.023	-0.003	-0.000
	(0.231)	(0.064)	(0.073)	(0.009)	(0.001)
age	0.093	0.003	0.044	-0.007	-0.001
	(0.149)	(0.041)	(0.047)	(0.006)	(0.001)
Constant	66.269***	40.800***	9.215***	4.477***	0.586***
	(5.517)	(1.528)	(1.748)	(0.217)	(0.028)
Observations	80	80	80	80	80

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

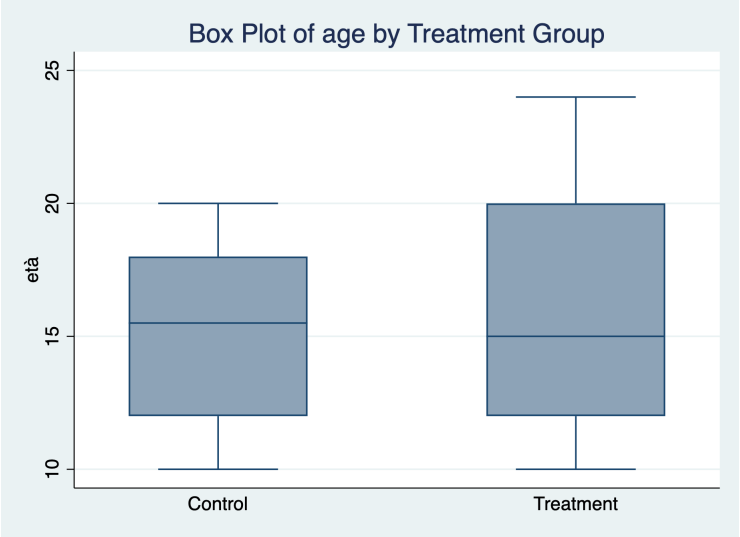

Figure 6: Box Plot of age by Treatment Group

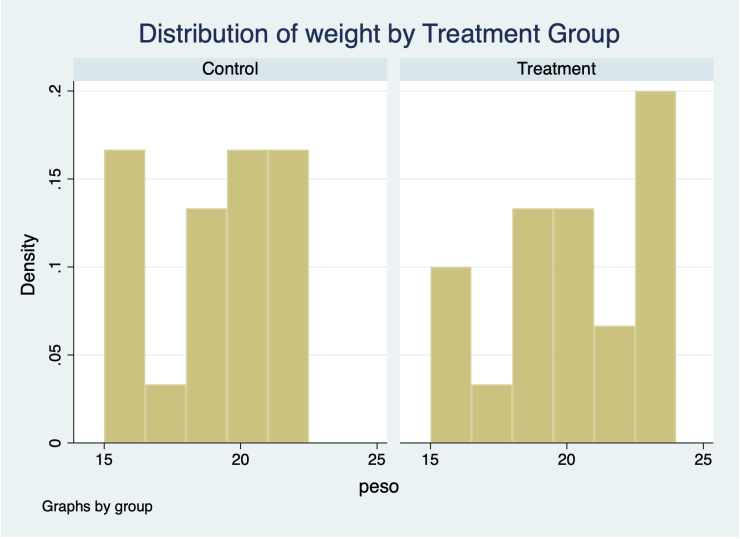

Figure 7: Histogram of age by Treatment Group

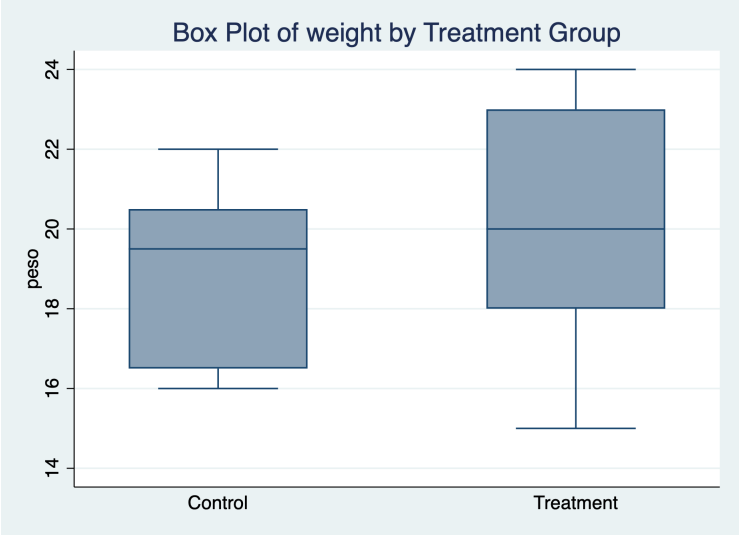

Figure 8: Box Plot of age by Treatment Group